JUNE 25, 1924

THE RUBBER AGE

VOL. XV. NO. 6

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THE RUBBER AGE

The Only Twice-a-Month Rubber Publication

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CONFERENCE HELD ON CRUDE CONTROL PLAN

Representatives of the Department of Commerce Discuss Pros and Cons of Plan for American Control of Crude Rubber

At a recent conference held in New York to which representatives of the Rubber Association and others interested were invited, Department of Commerce officials outlined the American crude rubber control situation. Although the Philippines and parts of South and Central America provide regions where the soil and climate are suitable for first-class rubber plantations, certain unfavorable economic and legislative factors must be carefully considered before such projects could be started on a competitive basis with the large areas in the East where 95 per cent of the world's output is now produced.

Investigators who have just returned from explorations and surveys in the Far Eastern and American tropics, have explained that the total area planted in the East was found to be about 4,266,000 acres, of which 2,729,000 acres are owned by European and American capital and 1,537,000 acres by Asiatics. About 3,500,000 acres are producing or old enough to be tapped. Through domicile of plantations in British territory, and through ownership of plantations by British capital in other territory, Great Britain controls 77 per cent of the total area under rubber. American capital invested in the East is estimated at only $32,000,000 against $489,000,000 for Great Britain, $130,000,000 for Holland, $40,000,000 for Japan; $27,000,000 for France and Belgium; and $47,000,000 for other European countries.

The Commerce Department investigators believe that the operation of the British restriction laws adopted in November, 1922, will probably reduce the aggregate potential output for the years 1924, 1925, and 1926 by upward of 200,000 tons of rubber. Rubber planted by the native population and old areas on European estates, which have not been properly cared for, are expected to show declining yields in the future.

Ample land and labor are available for new planting in Malaya, Sumatra, and Indo-China, but India and Burma are not attractive because of unfavorable climatic conditions. Very little desirable unoccupied rubber land is left in Java and Ceylon. Taxation is a serious drawback to further investment in Netherlands India; while in Indo-China American capital would probably experience considerable difficulty in acquiring control over large areas under the present and proposed corporation laws. Low price levels at present are curtailing new plantings in the East. Were all areas in that region producing to capacity it is estimated that their potential output would be approximately 500,000 tons for 1924; 550,000 for 1925; 580,000 for 1926; 600,000 for 1927; 610,000 for 1928; 612,000 for 1929; and 616,000 for 1930.

Concerning possibilities in the Philippines, the Commerce Department representatives expressed the opinion that the dangers of typhoons and lack of labor supplies, two deterrent factors stressed in previous reports, had been exaggerated. The uncertainty of the present political situation with respect to the Philippines and the reported lack of encouragement toward the introduction of large American or other investments are outstanding factors in the situation as a whole which militate considerably against rubber developments in the islands.

Extensive investigations were conducted in the islands of Mindanao, Basilan, and Jolo, where more than 1,500,000 acres of land were located as having the topography, soil and climatic

(Continued on next Page)

FREE RIMS AND WHEELS WITH FIRESTONE TIRES

The Firestone Tire & Rubber Co. recently announced to its dealers a new sales plan of giving free rims and artillery type wheels to purchasers of a set of balloon tires and tubes. It is said that this new policy is equivalent to a 15 per cent reduction in balloon tire prices. As the Firestone company manufactures its own rims and wheels, a substantial profit may be made by the increased sales the new policy will create.

The plan has caused considerable discussion in both retail and manufacturing trade circles as to the possibility of other companies taking similar steps or making a corresponding reduction in the prices of balloon tires. *(See story on Page 211)*

MAY RESTRICT SALE OF BALLOONS IN ENGLAND

Use of Rubber Toys Capable of Being Inflated by Breath may Soon be Stopped —Prejudice Against them Growing Due to Accidents

(Special to THE RUBBER AGE*)*

American toy balloon manufacturers have long enjoyed a considerable export trade to Great Britain. Toy buyers of all the large London stores are unanimous in their praise of the quality of the American article, which up to now has been easily able to hold its own on this market in competition with the products of all other countries. Consequently the new regulations which are now being enforced in a number of English cities and towns will greatly affect American trade in this line, and should be acted upon immediately in order to prevent any possibility of over-production. The first restrictive legislation concerning toy balloons was passed in England several years ago, when an act was passed prohibiting the inflating of balloons with gas. This did not hit the toy manufacturer, but simply meant they should be air inflated as the lesser of two evils. However, several cities have now made provisions against the sale of balloons. The reason for this step is the great increase in the number of children choking when blowing them up. A boy on becoming short of breath naturally draws in to regain it, the vacuum thus created causes the balloon also to be drawn inward, where it firmly lodges in his throat, causing asphyxiation in a few minutes. In a recent case, although a doctor was called, he found it impossible to dislodge the plaything and was forced to push it into the child's stomach, the child dying before the operation was completed.

The first prosecution under the new restrictive bye-laws has just been instituted. The defendant was summoned for distributing toy balloons inflated or capable of being inflated by human breath, and was liable to a fine of $25.

Although balloons may still be lawfully sold in London and the majority of the large English cities, the prejudice against them is growing and action to prohibit their sale will probably be started in a number of districts in the near future.

(Continued on next Page)

CONFERENCE HELD ON CRUDE CONTROL PLAN

(Continued from Page 209)

conditions favorable for the planting and cultivation of the Para rubber tree on a commercial scale. A number of small plantations aggregating 2,500 acres already planted to rubber now exist in this region, and produce yields which compare very favorably with the best rubber growing areas of the East. The present land law, however, which prevents the acquisition of more than 2,500 acres by any one company or individual is a handicap against plantation developments on an economic quantity basis sufficient to make America independent of foreign production.

The Commerce Department's crude rubber investigating party which covered the Philippine Islands also conducted a survey of British North Borneo. While this region is one of the minor plantation rubber areas of the world, it has shown an increasing volume of rubber exports over the past few years and may hold an important place in the future. While a British protectorate, it retains a quasi-independent political status which is unique in that it is administered by the British North Borneo Company under a royal charter, almost independent of the Colonial Office. The company promulgates its own laws, issues its own currency, stamps and executive decrees, levies its own import and export duties and internal taxes, and holds sovereign title to all lands.

The countries visited by the Commerce Department's Caribbean party were Guatemala, Salvador, Nicaragua, Costa Rica, Panama, Colombia and Ecuador. Information was also gathered on western Venezuela and southern Mexico. Physical conditions suitable for Para rubber cultivation were found in small portions of northern Guatemala; portions of Honduras, extensive areas in eastern Nicaragua and northeastern Costa Rica; limited and segregated areas in Panama; sections contiguous to the Atrato and San Juan rivers in Colombia; limited areas in southwestern Colombia, in the vicinity of Tumaco; and an extensive area on the coastal plain of Ecuador. It should be carefully noted, however, that this commendation does not necessarily apply to certain important factors regarding labor, taxation and legislation, which in some cases present formidable obstacles. Conditions are regarded as least suitable, due to definite dry seasons in southwestern Mexico; southern Guatemala; western Costa Rica; southern Panama west of the Canal; and certain arid regions on the coast of Ecuador.

The aggregate area of desirable land in tropical America is sufficient for the development of rubber plantations to rival the present cultivated area in the East.

It was found that, generally, taxes on land are either non-existent or inconsiderable, and the land tenure conditions very greatly.

The attitude of the various Republics toward the Commerce Department investigators was one of extreme cordiality and sincere desire to point out means of making land available for enterprises of large magnitude. In some cases, where existing laws appeared to impede such development, it was intimated that if there were sufficient incentive there was a possibility of enacting laws to meet the special conditions.

All of the regions enumerated are in a strong strategic position from the standpoint of transport. The total labor force of the Central American and Colombian region available for large planting developments is estimated at not to exceed 40,000 men, sufficient for from 120,000 to 150,000 acres. For operations of magnitude, it would, therefore, be necessary to draw on the outside for a labor supply.

The Amazon investigation covered Bolivia, Peru, the disputed territory between Colombia and Ecuador, the three Brazilian States of Amazonas, Matto Grosso and Para, and the Acre Territory of Brazil. The party was greatly aided by the Brazilian Government. Topography and climatic conditions favorable to the production of plantation rubber are reported over large areas along the main river and south of it. The presence of the South American leaf disease on wild rubber trees in many parts of the Amazon Valley is a danger that should be carefully considered before plantation rubber is undertaken. The plantation industry of Dutch Guiana has been practically wiped out by this disease. The Governments are apparently very favorably inclined toward new projects, especially rubber developments in Amazonas and Matto Grosso.

It was explained that the complete data secured will be published at the earliest opportunity in the form of separate reports covering the different regions. This information will deal with every important phase of the industry.

RUBBER SHACKLES HELP WIN RACE

Without rubber, a racing car would be an object of curiosity instead of admiration. On the race track rubber tires receive a more gruelling punishment in a few hours than they do on pleasure cars in months; only the best of tires stand up under this test, and the mere fact that a certain make of tire finds favor with racing drivers is considered an index to its desirability by the public.

Recently, in the 500 mile race held at Indianapolis, Ind., a Duesenberg car, No. 15 in the lineup, won. The winning car was equipped with rubber shock insulators manufactured by the Rubber Shock Insulator Co., Inc., New York City. According to F. S. Duesenberg, racing cars so equipped experienced less trouble with motors and tires than those equipped with the commoner spring fastenings. Racing drivers are sold on this equipment because it adds both comfort and safety.

MAY RESTRICT SALE OF BALLOONS IN ENGLAND

(Continued from Page 209)

It would seem that here is presented an opportunity for American inventive genius, for the various measures passed all distinctly say: "balloons inflated or capable of being inflated by human breath." No objection is offered to the sale of those which cannot be so inflated. If a sealed balloon without a mouthpiece were introduced it can safely be said that it would find universal favor in Great Britain. These would either have to be filled with compressed air before shipment (which would present an almost insurmountable packing difficulty) or exported deflated for mechanical filling in this country, after which they would have to be sealed or vulcanized by the importers. The British trade hopes that the difficulty can be bridged in some way, as the American toy balloon is a staple over here, whose popularity continues to grow with the users, if not with their elders.

Davol Opens New Building

The large new building of the Davol Rubber Co., extending from South St. nearly to the edge of the river, Providence, R. I., was opened recently when employes held a dance to mark the 50th anniversary of the founding of the company. Joseph Davol established the company in 1874 and it was granted a Rhode Island charter in 1882.

Charles J. Davol, son of the founder, is president and treasurer; Charles B. Bamforth is secretary and acting treasurer; and P. R. Wesley is general mananger. The new building gives the Davol company a floor space of nearly five acres.

Takes Over Lambertville Plant

As the contract by which the Stevenson Corporation operated the factory of the Lambertville Rubber Co., Lambertville, N. J., has now expired, the financial interests controlling the plant have taken it over. The Stevenson company has been in control for the past two years. Thomas R. Shepard will be in direct control. It is expected that changes will be made in an endeavor to increase efficiency so that a larger output of rubber boots and shoes may be manufactured.

Completes Plans for Convention

According to Art Roderick, chairman of the convention committee of the National Tire Dealers' Association, all tentative arrangements for the convention of the association have been worked out. The convention will be held in Akron November 18 to 20, inclusive, at the Ohio National Guard armory.

George J. Burger, president of the national association, was the principal speaker at a recent meeting of the Akron Retail Tire & Accessory Dealers' Association.

FIRESTONE REDUCTION STARTS OTHER CUTS

Goodyear, Miller, Seiberling, General, Goodrich and United States Companies Follow Suit, According to Report from Industry —Fisk Makes Latest Decrease

NEW YORK, June 19, 1924—The announcement by Firestone that free wheels and rims would be given with purchases of balloon tires (See Page 209, this issue) has started a trade war. Other companies have followed suit. In fact, if action in Cleveland may be understood to apply to other cities as well, a majority of the largest and best known manufacturers have adopted the free wheel and rim policy.

This amounts to a price reduction of from 12 to 15 per cent as the companies had previously been selling the wheels and rims. The concessions, in most cases were made only to dealers, but were passed on. Our report from Cleveland stated that the Goodyear, Miller, General, Goodrich, United States and Seiberling companies had put this change into effect. Fisk, after adopting the free rim and wheel policy for a few days, substituted a price reduction effective yesterday. The Fisk company announced a cut of 15 per cent on cord tires from 32 x 3½ to 37 x 5 sizes, inclusive, in addition to cutting the price of their balloon tires from 15 to 20 per cent, depending on size. Smaller reductions were announced by this company on Ford sizes.

One company, according to a Cleveland dealer, went so far as to give free tubes when new wheels were not needed. Branch managers interviewed in Cleveland claimed the cut to be "fundamentally unsound."

Another manager said the scheme was dictated by the inability of tire agents to get enough wheels to equip customers owning old cars, and that the tire companies had stepped into the breach by buying quantities of wood and metal wheels. This unexpected wheel shortage, another product of the almost too successful publicity of the balloon tire makers, is being overcome, he said.

The Firestone company has been making wheels several years and this gave it the jump over the others when the wheel shortage came on. The other companies have been buyirg from wheel manufacturers the wheels they have been selling with their sets of balloons.

E. G. Wilmer, chairman of the Goodyear Tire & Rubber Co., sailed June 14 on the Olympic. He said that the Goodyear company is making about 25,000 tires daily and has met the Firestone free wheel policy. From 30 to 40 per cent of this output is balloon tires. "The balloon tire is a practical development and here to stay," he added. "The only question is selling the public on the proposition." It is Mr. Wilmer's belief that about 50 per cent of the cars manufactured next year will be equipped with balloon tires which will gradually replace the high pressure type.

"Our dealer and replacement business is good and up to expectations," he continued. "We have met the Firestone proposition by giving a wheel and rim with our tires and this proposition is now in the hands of dealers. I don't expect any price cuts in the tire industry and I think things will be moving along smoothly for some time.

"Crude rubber is showing a good deal of weakness but I expect it to strengthen a little later."

Rubber Flooring in a Soda Shop

Art rubber tile recently installed in the L. & D. Confectionery at Richmond, Va., by the Acme Rubber & Flooring Co., of which E. P. Moore is president and J. Irving Bear, secretary.

R. A. BRUSSELS EXHIBIT AWARDED TWO DIPLOMAS

For its splendid exhibit at the Sixth International Exhibition of Rubber, Other Tropical Products and Allied Industries held April 1 to 16th inclusive at Brussels, Belgium, the Rubber Association of America was recently awarded two diplomas. One, signed by the chairman and secretary of the Rubber Growers Association, Inc., was awarded by the British association for exhibits relating to the rubber manufacturing industry in the United States.

The second, a diploma of honor for the prize exhibit, was awarded by the exhibition management. It is signed by the Honorary President Rt. Hon. Lord Kyslant, G.C.M.G.; the Honorary Vice President Sir Wyndham P. Dunstan, K.C.M.G., L.L.D., F.R.S.; Sir Ernest Birch, K.C.M.G., who was the Honorary Chairman of the Executive Committee; and H Greville Montgomery, director. The two diplomas have been framed and hang in the offices of A. L. Viles, general manager and secretary of the Rubber Association, at 250 West 57th St., New York.

Photographs of the exhibit of the Rubber Association are reproduced on page 215.

Racine Horseshoe Elects

At the annual meeting of the stockholders of the Racine Horseshoe Tire Company held recently at Racine, Wis., William T. White was elected to succeed S. Harold Greene of Boston as a director. All other directors were re-elected.

At the directors' meeting following the stockholders' meeting, all officers were re-elected.

The president's report stated that the plant continues to operate twenty-four hours a day and profits are being maintained at a satisfactory level.

Fisk Reports Profits

The Fisk Rubber Company reports net sales for their six month's period ended April 30, 1924 of $23,200,000, with operating profits after depreciation but before interest and Federal taxes of $1,453,923. After interest and Federal taxes they carried to the general surplus $754,760.

As a result of the company's policy of restricting dealers' spring shipments for their actual requirements only, thereby preventing excessive stocks as occurred in 1920-1921, they appear to be in line for a very satisfactory business in the selling months to come.

Gorsuch Goes to Faultless

E. H. Gorsuch has resigned his position as chief chemist for the Mason Tire & Rubber Co., Kent, Ohio, to take a similar position with the Faultless Rubber Co., Ashland, Ohio. Mr. Gorsuch succeeds R. R. Olin who recently resigned as chief chemist at the Faultless plant.

GOODYEAR WARNS PUBLIC AGAINST BALLOON ABUSE

The Goodyear Tire & Rubber Co. recently issued statements to the press that aim to warn the users of balloon tires against underinflation and overloading which cut down the mileage of this type of tires in as great a degree as they do with high pressure tires.

"A drop of from 5 to 10 pounds represents a big percentage of decrease in the recommended pressure. Owners of cars with balloon tires should never let the pressures drop more than 10 per cent below the recommended inflation for a normal load. If the recommended pressure is 30 pounds, the absolute minimum is 27 pounds of air, below which the tire is certain to suffer damage.

"The accompanying table of pressures for a normal load with balloon tires is given for handy reference. To determine the load on each tire the car owner should weigh the car first front and then rear with a normal passenger load. Then divide the front load and the rear load by two to get the actual weight on each front and rear wheel and then follow the schedule shown in the table."

Load and Inflation Table for Goodyear Small Diameter and Interchangeable Balloon Tires

Inflation Pressure	Cross Section Sizes and Load Per Wheel						
	4.40	4.95	5.25	5.77	6.20	6.60	7.30
22	500	....	700	....	900	....	1150
24	550	....	760	....	980	....	1260
26	600	725	820	880	1060	1160	1370
28	650	780	880	950	1140	1250	1480
30	700	835	940	1020	1220	1340	1590
32	*750	890	*1000	1090	*1300	1430	*1700
34	800	945	1060	1160	1380	1520	1810
36	850	*1000	1120	1230	1460	1610	1920
38	....	1055	....	*1300	....	*1700	....
40	....	1110	....	1370	....	1790	....
42	....	....	....	1440	....	1880	....

*Maximum desirable load.

"Dixie" Clay Expansion

The North American Clay Company, a New York State corporation, has recently been organized by the R. T. Vanderbilt Company.

The North American Clay Company has been organized for the purpose of expanding the mining operations and increasing the output of "Dixie" Clay. An increased amount of capital has been put into this new company, which is the clay mining operating company. The "Dixie" Clay sales will be handled in the name of the R. T. Vanderbilt Company as heretofore. R. T. Vanderbilt is Chairman of the Board of Directors of the North American Clay Company.

The demand for "Dixie" Clay increased so much during the first part of 1924 that the old mining organization, worked to capacity, was not able to produce sufficient amounts of this material prepared for shipment to rubber goods manufacturers. Accordingly, the new and larger company has been incorporated with increased capital that has been used for the installation of new mining, drying and grinding machinery. Part of this new equipment is already installed, and when the remainder is in place, which will be within the next two months, the capacity output of the plant will be doubled, thereby insuring customers for this well-known commodity a steady supply.

LORD MAYOR INVITES TRADE TO WEMBLEY

The Editor has received a letter from The Rt. Hon. Lord Mayor of Hull, E. Ernest Keighley, J.P., in which he issues a cordial invitation to the American rubber trade to visit the City of Hull England, while they are attending the British Empire Exhibition in London.

The city was founded in 1299. Efforts will be made to make the visits of American rubber executives not only a memorable but a particularly happy one.

S. A. Duty on Rubber Hose

An additional dumping duty on rubber hose imported into the Union of South Africa from the United States has been provided for in a proclamation of the Governor General dated April 1, 1924, and published in a government gazette extraordinary April 16.

This proclamation is made under section 6 of Act. No. 35 of 1922 on the ground that certain categories of rubber hose from the United States are being sold in South Africa at a price less than the price at which similar goods are sold wholesale in the United States plus cost of packing, f.o.b. charges, and ocean freight, and that as a result an industry in the Union is seriously affected. The dumping duty is to be equal to the difference between the two prices noted above.

The categories of hose to which this duty applies are: (a) Rock drill, water, and air hose; (b) delivery hose, viz., acid, beer, steam, sand blast, water, pneumatic tool, radiator, wine and spirit proof, and oxy-acetylene; (c) suction hose, rough and smooth bore, including wine and spirit proof hose; (d) railway hose, viz., vacuum tender feed, car steam heating, washout, and engine spray.

A special dumping duty on rubber hose of United States origin, effective from February 15, 1924, and limited to 25 per cent ad valorem, was announced by the Department of Commerce recently. The present proclamation does not limit the dumping duty to any percentage ad valorem, being limited to the difference between the prices mentioned in paragraph two above.

S. Dakota Dealers Organize

An organization which will combine the buying power of many of the largest tire dealers in the Sioux Falls trade territory has recently been incorporated under the laws of South Dakota. It will be named Motor Accessory Dealers, Inc.

According to C. A. Cronin, president of the new company, the individual buying power of many dealers have been combined in order to enable them to buy tires and tire accessories in quantities for cash at a price attractive enough to the manufacturers to give the new company a concession. Mr. Cronin said that negotiations had begun with the Mohawk Rubber Co., Akron, Ohio.

MILLER MAY RESUME DIVIDENDS NEXT YEAR

Unless wholly unforseen adverse conditions develop during the balance of this year, the Miller Rubber Co., Akron, Ohio, is expected to resume the payment of common dividends, passed in 1920, at the beginning of 1925. Earnings continue as satisfactory as in 1923 when they were $25 a share, and in 1922 when they were $33 a share common stock. The dividends due on the preferred stock have been regularly paid off until at this writing only $4 a share is due stockholders.

The directors are not expected to deviate from this policy of paying off back preferred dividends at the rate of $1 a share a quarter as it has been their policy to conserve cash resources in every possible way. Although reductions in the price of crude rubber and tire fabrics have materially affected production costs, increases paid to tire builders have partly offset them. Production has been uniformly high for more than eight months and the manufacture of balloon tires, of which the company is said to be turning out more than 2,000 a day, has materially added to its profits.

Pass Preferred Dividend

Directors of the Kelly-Springfield Tire Co. at a recent meeting passed the quarterly dividend of 1½ per cent on the 6 per cent preferred stock. The dividend, which is cumulative, has been paid regularly for the past ten years. The passing of the dividend adversely affected other rubber stocks.

Organize to Buy Plant

At a recent meeting of the guarantors of the industrial fund in the Chamber of Commerce rooms at Poughkeepsie, N. Y., a corporation was formed to act as holding agent for the factory of the Corrugated Rubber Co., Judge C. W. H. Arnold presiding at the meeting.

When the building is placed on sale July 8 this new corporation will buy it. Directors are Edward F. Gary, H. R. Gurney, P. A. Burnes, C. W. H. Arnold and Ralph Butts.

The property, which was built for the use of the Corrugated Rubber Co. for the manufacture of rubber goods of various kinds, is being offered for sale in order to satisfy a first mortgage of $30,000 held by the Poughkeepsie Trust Co. In addition to this mortgage a second mortgage amounting with interest charges to $39,125 is guaranteed by fifty members of the Chamber of Commerce.

To Sell Corrugated Plant

Arthur S. Halpin, referee, will sell the factory of the Corrugated Rubber Co., Poughkeepsie, N. Y., July 8. The sale, which will be held at the court house, is on a foreclosure brought by the Poughkeepsie Trust Co. on a first mortgage of $30,000. Appraisers have set a value of $100,000 on the plant. Any excess above the $30,000 will be applied to the second mortgage, it was said.

FREMONT RUBBER PRODUCTS CO. ORGANIZED IN OHIO

At a recent meeting of stockholders the organization of the Fremont Rubber Co., Fremont, Ohio, was completed. The company is incorporated for $25,000, with all stock subscribed and paid in. Officers are M. Brailey, president and treasurer; D. B. Love, vice president; and Lou. D. Weber, secretary.

The new company has leased the plant of the former Fremont Reversible Window Co. on West Croghan St. and is now making numerous changes and installing mills, calenders and presses. Mechanical and molded rubber goods of all kinds including auto mats, stair treads, belts, floor rugs and similar articles will be manufactured. Contracts are said to be on hand to keep the plant busy for some time. Production is expected to begin about the end of June.

Will Henry Ford Grow Rubber?

The recent purchase by Henry Ford of a tract comprising more than 8,000 acres in Henry County, Fla., centering around Labelle, the county seat is believed to be a step in the direction of a rubber plantation. It is said that the auto magnate paid over $500,000 for the land, which includes the townsite of Goodno on the Atlantic Coast Line Railway and the public utilities as well as a number of buildings in the town of Labelle.

Months ago tentative plans for the establishment of a rubber plantation in Florida were discussed by Mr. Ford, Harvey S. Firestone, president of the Firestone Tire & Rubber Co., and Thomas Edison. For some time experiments with rubber growing have been carried on in Florida.

Fewer Foreign Golf Balls Used

In the first four months of this year, 781,179 golf balls, valued at $291,527, were imported, as compared with 1,341,008, valued at $561,064, in the corresponding period of 1923, the Specialties Division of the Department of Commerce reports.

During 1923, official statistics show imports of golf balls into the United States numbering 2,839,166 valued at $1,173,679. England supplied 2,674,809, valued at $1,121,543; Scotland, 122,304, valued at $34,985; and France, 42,028, valued at $17,141.

On the basis of the estimated consumption of 13,200,000 golf balls in the United States during 1923, imported balls accounted for 21.5 per cent of the domestic trade during that year.

FLYNN QUITS AS GOODRICH LABOR SUPERINTENDENT

M. A. Flynn, superintendent of labor for the B. F. Goodrich Co., Akron, Ohio, has resigned, it became known recently. Officials gave no reason for his action but much regret was expressed. A reorganization of departments and personnel, it was said, has made it unnecessary that his post be filled and no one will be appointed in his place.

Mr. Flynn went to Akron from the Revere Rubber Co. in 1895 to take the position of production manager with the then newly-formed Diamond Rubber Co. When the Diamond company was taken over by Goodrich in 1912, he became production manager of all factories. In 1914 he was made plant superintendent and soon after was appointed superintendent of labor. He has made an extensive study of labor conditions.

It is believed that Mr. Flynn will take a vacation of several months before taking another position.

Ajax Sales Good

According to J. C. Weston, chairman of the board of the Ajax Rubber Co., sales for May were the largest in the history of the company. He added that June will show a relative increase.

New Officers of the Mason Tire & Rubber Co.

W. A. Cluff,
President & Treasurer

J. H. Diehl,
Vice Pres. & Gen. Sales Mgr.

T. G. Graham
Factory Manager & Director

In our last issue we reported the change in the management of the Mason Tire & Rubber Co. Above are shown the newly-appointed officers.

No radical change in the operation of the company has been announced by President Cluff. By strictest economy he hopes, however, to turn the deficit of $535,000 shown last year into a substantial profit.

"Gross sales have increased from $300,000 in November to more than $3,500,000 for the first four months of this year, an average of about $900,000 a month," said Mr. Cluff recently. "This is an annual rate of $10,800,000 compared with $7,000,000 in 1923. The company's financial position is satisfactory as evidenced by the ratio of current assets to current liabilities of about 2 1-2 to 1."

The company recently acquired the tire plant at Bedford, Ohio, which increased its production facilities to 6,000 tires a day. At this writing it is turning out 2,300 tires a day at the Kent plant and 1,200 at the Bedford plant.

EXTENT OF PRODUCTION CUTS IN AKRON PLANTS

Output of Tires is Estimated at About 80,000 a Day as Compared with 110,000 at Peak—Process of Curtailment Gradual and Orderly

Seasonable tire production curtailment continues in Akron, Ohio. The daily production of tires is now estimated at approximately 80,000 at this writing for the entire industry which compares with 110,000 at the peak three months ago and 80,000 at the beginning of June. It is also estimated that approximately 4,000 tire builders have been thrown out of work. By the time production curtailment has run its course this number may be increased to more than 70,000. The cuts in the output of the tire plants has been gradual and orderly with no resulting disturbance in the industry.

Gradual drops in the production of mechanical goods during the past weeks have resulted in an output that is about half of normal output. Production of mechanical goods is one of the best barometers of the industry and is very sensitive to industrial fluctuations.

Earnings of the tire companies for the first quarter showed a considerable improvement over the preceding quarter and in some instances were higher than those for the first three months of 1923. Most of the important companies are now showing a net operating profit of more than 10 per cent on sales. The Firestone Tire & Rubber Co., General Tire & Rubber Co. and the India Tire & Rubber Co. continue to earn and pay dividends. The Goodyear Tire & Rubber Co., the Miller Rubber Co. and the Mohawk Rubber Co. also show high earnings. No large established company is reported to be showing losses because of the good business done in the first quarter.

The B. F. Goodrich Co., it is believed, will make a much better showing for the first half of this year than for the same period in 1923.

The end of the bad weather, now in sight, is expected to make a deep hole in tire inventories which are now estimated in excess of 18,000,000 casings.

Tax Reduction Effective On July 2—not July 3

Recent advices from the United States Treasury state that the tax reduction, cutting the tax on tires, tubes, parts and accessories from 5 to 2 1-2 per cent, which became a law June 2, is not effective until July 3.

It was supposed that this tax cut became effective July 2 because the law read "on and after the expiration of 30 days after the enactment" of the act. Manufacturers are warned to keep a careful record of the sales made on July 2 so that if the tax at the rate of 5 per cent is paid on sales made on that day and eventually it is held that the effective date of the reduction is July 2 the amount of overpayment, subject to refund may be ascertained.

Armstrong Moves

The main office of the Armstrong Rubber Co., Inc. was moved from 361 Seventh Ave., to 1 Madison Ave., New York City on May 29. The plant of the company is at West Haven, Conn. Mr. George T. Armstrong is President and James A. Walsh is Factory Manager.

Paul Rubber Offered Lots

To facilitate the opening of the former plant of the Ardmore-Akron Tire & Rubber Co., recently purchased by the Paul Rubber Co., of Salisbury, N. C., 1000 building lots in the industrial section of Ardmore, Okla., were offered to H. W. McConnell, president of the Paul Company.

The Paul Rubber Co. has been in operation at Salisbury since 1920 and is said to employ 300 men. Purchase of the Ardmore-Akron plant was in keeping with the plans of the company to move westward. According to J. L. McCowans, vice president and general manager of the Amalgamated Tire stores, the chain expects to handle at least half of the output of the Paul plant.

Pell and Dumont Separate

The two principal members of the firm of Pell & Dumont, Inc., crude rubber brokers formerly at 9 Hanover St., New York City, have opened separate offices. Louis W. Dumont recently announced that he has gone into crude rubber brokerage under the name of L. W. Dumont & Co. at 132 Front St., New York. A few days later George E. Pell issued an announcement that he is conducting a similar business under his own name at 165 Broadway.

Fire Destroys Scrap Rubber

Several carloads of scrap rubber valued at $5,000 were destroyed in a recent fire which also damaged one of the buildings of the Pioneer Rubber Mills Co., Pittsburg, Cal. Sparks from the boiler room are believed to have caused the blaze. The loss was only one per cent of a blanket insurance policy of $518,150.

Welcome Road Officials

W. O. Rutherford, vice president of the B. F. Goodrich Co. and president of the Rubber Association, participated in the recent welcome extended by President Coolidge, Secretary Hughes and others to the Pan American Highway Commission at Washington. The delegates are in America to inspect our roads. They are expected to visit Akron late in June.

Goodyear Opens New Branch

According to C. W. Martin, Jr., of Atlanta, Ga., Southern Division Manager for the Goodyear Tire & Rubber Co., a branch was opened at Albany, Ga., June 2. The new branch will be under the management of W. G. Starnes, who has been managing the Atlanta branch. The decision to locate a branch in Albany was made after a conference with Albany Chamber of Commerce officials. Tires and all kinds of rubber goods except boots and shoes and druggists' sundries will be distributed to a wide territory from the new branch.

Keds Division Shuts Down

The Keds division of the National India Rubber Co., a subsidiary of the United States Rubber Co., according to an announcement posted recently at its Bristol, R. I., plant, will shut down for three months, beginning June 28. The Keds division employs 2,100 persons. The wire division, in which 450 are employed will also close down for the same period. It was announced that when the plant reopens that reduced wages will be paid.

Shugart Returns from Trip

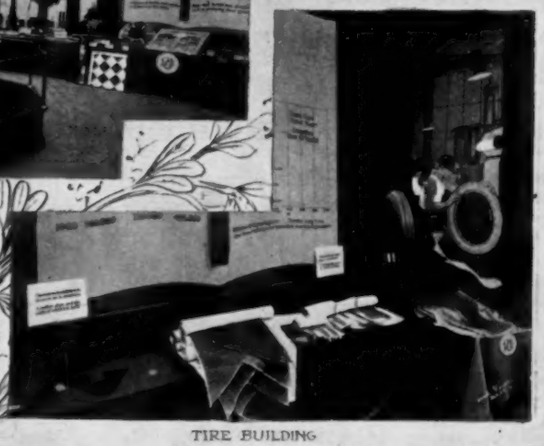
George S. Shugart, vice president of the United States Rubber Co., recently returned to New York from a trip to the Pacific Coast and a tour of the southern states on his way east. He reports that conditions are fairly satisfactory, that tire stocks are moving and that dealers are by no means overstocked. Outside of the large cities, he adds, balloon tires are arousing little interest so that the time-tried brands of high-pressure sizes continue to constitute a large percentage of the sales.

FIRST OFFICIAL PHOTOGRAPHS

AMERICAN
RUBBER EXHIBITS
AT
6TH INTERNATIONAL
EXPOSITION

HELD IN
BRUSSELS, BELGIUM
FROM
APRIL 1-16, 1924
(Courtesy R.A.A. Inc.)

DRUG SUNDRIES & TOYS

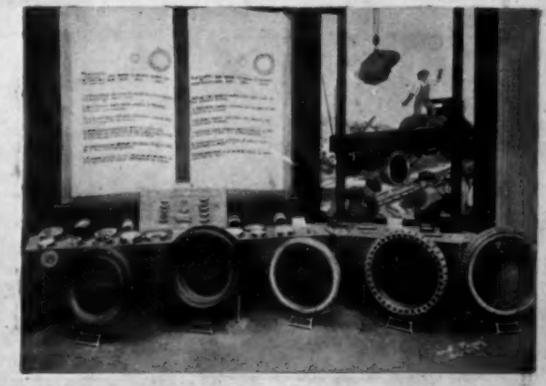


TIRE BUILDING

FOOTWEAR

HOSE

FOOTWEAR



TIRES

Balloons Brought Chaos to Auto Industry

Owner also Suffered by Confusion Resulting from Effort to Fit all Tires to One or Two Rims, Says Prominent Auto Manufacturer

(Written Especially for THE RUBBER AGE)

By Captain E. V. Rickenbacker
Vice President, Rickenbacker Motor Co.

EDWARD VERNON RICKENBACKER

THE story of the balloon tire is humorous in some of its aspects and mighty serious in others. That phase of the story which, were it told, would indicate how blithefully tire manufacturers went ahead to develop a set of standards, without reference to the unimportant fact that these tires were made, must comply with the requirements of automobiles already designed and in production—and to change the design of which would cost hundreds of millions of dollars—is humorous.

The other side of the story is almost tragic. Because it has resulted in tire dealers being loaded up with stocks of so-called "standard balloons" and "bastard sizes" in the form of so-called "balloon types;" it has resulted in expensive dies for steel disc wheels for those different sizes of tires which must now be scrapped, and wheels must sooner or later be scrapped also. In a word, it has resulted in endless confusion and almost endless expense.

No one believes of course that the tire makers are going to continue to make these "standards" which they themselves established, when automobile makers insist upon other standards which, in response to this demand, tire manufacturers must make.

Meantime the automobile manufacturer is confronted with a demand for tires which he cannot furnish, without sacrificing road clearance or other indispensible qualities to use balloon tires or not and if so, what sizes or proportions.

Of course the tire makers never did develop balloon tires—any more than the automobile manufacturer developed the running-board or the windshield on an automobile. General Public, that famous leader, has been the great inventor and the great pioneer in practically all improvements—manufacturers' advertising claims to the contrary notwithstanding.

To be perfectly frank; tire makers know less about the actual performance of tires in actual layman-service than does the average automobile owner.

Tire engineers are like other engineers—either they give a new idea such intelligent abuse as to destroy any possible information it might furnish; or such intelligent "nursing" that they find out nothing of value.

The automobile user, on the other hand, is interested only in getting there and back and anything he discovers about tires is merely incidental.

It is to meet his neglect and abuse, that tires as well as automobiles must be sturdily built, if we are to give the user the utmost for his money. Of course this has not always been the aim of some manufacturers.

Short-sighted makers considered that the more rapidly their product destroyed itself the greater would be the market. This entirely overlooks the fact that the earnings of the average motorist are fairly constant, and just as soon as his expenditures go beyond this point he must retrench.

If the upkeep of his automobile becomes an over expensive item instead of justifying itself in the added pleasure and efficiency it affords, then he must abandon the automobile, or use it only when absolutely necessary.

However this is a digression. The balloon tire was developed accidentally—not by the application of super-intelligence. The owner was told to blow his tires to a certain tension. He wasn't told the truth even then.

A large margin of safety was provided by the tire maker to protect himself against the inattention he knew his product would receive from the customer because of the customer's ignorance of what should be done.

The margin was so great that it was invariably ignored with the inevitable result that tires were ordinarily inflated to a tension as much less, as they should have been more than, the margin recommended by the maker.

With the old fabric casing, tires went to pieces pretty rapidly due to the excessive heat generated by friction in the fabric.

However with the advent of cord construction, it was found that much lower pressure could be maintained without developing excessive heat; and with the lower inflation came a lesser tendency of the air to force its way out.

As a result there were less rim cuts and blow-outs than formerly despite the softer cushion between wheel and road.

Engineers are keen observers and quick to make deductions—even if they are not always inventors. And so it became apparent that, if twice the volume of air were used under half the pressure, it would sustain the load and better riding qualities would be enjoyed; also, thinner tire walls would result in still less friction and generate less heat. There, in a nutshell, you have the process by which the balloon tire was "invented."

(Continued on Page 223)

Burden Distribution in the Rubber Industry

Although this Paper Deals Particularly With this Problem in Rubberizing Plants, it is Applicable to the Whole Industry

By H. G. Schnackel, F.C.A.

Auditor, Vulcan Proofing Company, Brooklyn, N. Y.

IN rubberizing plants there are conditions which absolutely prohibit the adoption of certain methods for disposing of factory burden over production, because refinements of distribution which in one case would be of the utmost importance, in another would be absurd. And to exercise the faculty of judgment is of particular importance when determining methods to be employed in connection with burden distribution.

Probably more has been written on the subject of the treatment of burden than on any other phase of accounting, but with very few exceptions writers on this subject have labored under the fundamental misconception of cost accounting which regards the province of a cost system to be absolutely limited to furnishing the means of distributing the expense of a business as equitably as possible over its product.

In view of the fact that the primary and often the sole purpose of the usual elaborate systems of burden distribution is to enable correct information to be obtained as to the cost of the different products manufactured, it is pertinent to inquire whether even this limited demand is really met by such systems. When a system of burden distribution does not provide for distinguishing between the cost of production and the cost of idleness, which condition applies in the great majority of cases, however elaborate the refinements of burden distribution may be, the results are absolutely incorrect and misleading.

Methods Should Be Chosen Carefully

The purpose of this paper, therefore, is to lay particular stress upon the importance of choosing methods, which come nearest to filling the general condition of regular factory practice, because the absurdities of the usual methods of burden distribution are most evident, when the results obtained are considered from the standpoint of value to the rubberizer, who regards elaborate burden distribution as being in the same category as death and taxes—unpleasant and inevitable.

Since one of the principal functions of a cost system is to analyze costs into their component parts, it follows that there must be a corresponding analysis of the manufacturing operations. This is accomplished by dividing the factory into operating departments or production centers, the aim being to limit each department as far as possible to simple and uniform operations. These production centers or operating departments play a very important part in the development and distribution of burden, as they furnish a center about which the burden may be grouped, and from which the burden may be distributed over a limited field with a greater degree of accuracy. Each department or production center is taken as a unit wherever possible, if the department includes different machines or processes, a further subdivision of charges must be made within the department itself. The object is to reduce the unit of burden to processes of some kind, or to the machines used in such processes, and if possible carrying the data to the single machine.

Machinery is a great factor in the rubberizing business, particularly in the spreading division, and the necessity of knowing the expense of operation of these machines introduces the machine rate. The costs connected with machinery may be divided into four classes, as follows:

1. Those based on occupancy of space, which we may call Space Cost;
2. Those based on the cost of the machine itself, called Machine Cost;
3. Those based on special expense connected with the machine when in operation (not including power), called Machine-Use Cost.
4. Power Cost.

The Function of Burden Distribution

The primary purpose of the usual elaborate systems of burden distribution is to secure correct information as to the cost of the various products manufactured in a rubber plant. When such a system does not make a distinction between the cost of production and the cost of idleness, the results are misleading, claims Mr. Schnackel, who is a fellow in the Chartered Accountants Institute.

In the above article he discusses the difficult problem of burden distribution in such a comprehensive manner that his conclusions will undoubtedly be of interest to almost every rubber executive who has puzzled over accounting statistics in an effort to form an idea of the relation of costs to profits. Every manufacturer realizes the value of a thorough knowledge of the costs of their product. But how many of them have a cost system in which they are willing to place confidence in every instance?

The criterion for distributing burden over production on the basis of use of machinery is clearly time; the element of the same machine when in proper repair will always be capable of producing the same relative results. Even if the nature of a job requires lower speed, and loss is suffered, it is right that the loss should be charged to the order requiring such reduced speed rather than to the machine itself; for, so to speak, the loss is the fault of the job and not the machine.

A study of these four classes of cost will show how they can attach themselves to the machine. The first, based on occupancy of space, which we have called Space Cost is determined by the machine's occupancy of space, of rent or space cost of the entire establishment. This space is not determined by the mere floor dimensions of the machine itself, but it is the space necessary for its successful operation, with room for operatives, for feeding materials and delivering product, for passageways to and from it, etc. As a result of this subdivision, then, we find on account of space a burden of general cost which this machine must bear, and these elements of cost are usually as follows:

1. Interest on investment in land and all buildings thereon.
2. Repairs to buildings which are really part of the costs of running the machines, on the theory that they are built to house.
3. Depreciation on buildings which repairs can not prevent.
4. Taxes on land and buildings.
5. Insurance on buildings.

Allied to these, though figured on a somewhat different basis, are heat and light.

The second group of expenses called Machine Cost is divided into four normal elements:

1. Interest on the value of the machine itself.
2. Cost of repairs due to the passage of time rather than to use.
3. Depreciation that repairs cannot prevent.
4. Insurance (proportion of the total insurance on machinery).

The third group of expenses called Machine-Use Cost is divided into three elements as follows:

1. The direct expenses of operation such as for oil and cleaning, but not for power.
2. Repairs due to wear and tear.
3. Depreciation due to use.

The fourth group of expenses are self explanatory.

Power and Machinery Cost

The last group is Power Cost. The determination of the proportion which should be attached to each machine must be based upon many figures, but in principle it is very simple. If a power plant is maintained as a unit, it is subject to three of the four groups of charges that we have already connected with machines above, namely, Space Cost, Machine Cost, and Machine-Use Cost, together with the five elements upon its own building, machinery, and for its special use cost. The total of the power cost is divided by the total kilowatt hours consumed or horse-power hours of all machines as actually operated. The unit rate per hour is multiplied by the total number of operating hours of each machine.

This completes, roughly, the composition of costs applied directly to machines in particular production centers. The total for each machine cost divided by the number of working hours in any given period determines what is commonly called the "machine hour rate." Some allowance is always made, of course for necessary idleness of all machines, such as for repairs, oiling, cleaning, etc. Since all work is done by the authority of a job order, it is a simple matter for the operator when reporting his own time to report also the running time of the machine which he has used. This gives a figure of machine cost to be charged to each job order so reported; and it covers all the burden we have been able to attach to the use of machinery.

The determination of cost in connection with machinery has so far been on the assumption that all machinery is driven full time. Theoretically no machine should ever lie idle, except for repairs, oiling, cleaning, etc. Practically, this is impossible, and idle time is a matter of serious consideration and importance, and it may throw entirely out of usefulness the calculation of the machine rate. Therefore, the rate to be used (whether machine or otherwise) in applying burden to the output of any production center, should be based on what the burden of that rate bears to the burden necessary to run the production center at normal capacity, as the output in question bear to the normal output of the production center. Under such a method, there will be a certain amount of burden remaining whenever the production center runs below normal capacity, and a careful consideration of this item will show that it is not chargeable to production, but is a business expense incurred on account of maintaining a certain portion of the factory idle, which is directly chargeable to Profit and Loss.

Some Systems Defeat Own Purposes

There are systems of burden distribution that defeat the purpose for which they are introduced—instead of clarifying the situation the farther they are carried to their logical conclusion the more they seem to befog the issue so that finally a single figure on the Operating Statement represents an inextricable conglomeration of more or less irrelevant factors. This figure is the "unabsorbed burden" chargeable directly to Profit and Loss, which should be thoroughly analyzed so as to exhibit the expense of departments functioning below normal capacity.

No one method of distributing burden can be considered as orthodox, for everything depends on the particular existing conditions. Various modifications and combinations of methods for the distribution of burden have been used by rubberizers to meet special conditions. As for instance: The burden rate established for the compounding departments have been arrived at by dividing the total developed burden for these specific departments by the estimated number of batches compounded in a given period. Mixing department rate has been established by taking the total developed burden for each machine, dividing therein the estimated total batches mixed in a given period. In churning departments it has been proved impractical to use a machine hour rate, because of the difficulty in recording the time element. A pound rate for churning is therefore invariably used, calculations being based on the estimated number of pounds churned in a given period. In the cloth examining and make-up departments the rate is usually established by dividing the total yardage inspected for rubberizing in a given period into the total burden developed. In the spreading and doubling departments the total burden as developed is divided by the estimated machine hours of a given period, producing a machine hour rate for these operations. A machine rate is found properly applicable for the liquor curing departments, being applied in the same manner as the centers above. In the development of the burden rate for vapour and oven curing the best means found available is yardage, because the number of hours a piece of rubberized fabric may remain in the oven does not necessarily have any direct connection with the number of hours required to cure it, a machine-rate is not applicable to this center. In finished goods inspection the burden rate per yard has been determined as the most equitable, and ascertained by dividing the total burden developed by the estimated number of yards inspected, as based on past performance and what the inspection is approximated to be during the period within which the rate is to be in force.

A Definition of Burden

Many executives make the mistake of thinking that they can hurdle primary factors of cost and start right in on a segregation of expense by machines without first proving their distribution by departments as outlined above. Nothing is to be gained by such methods of procedure as they invariably result in disaster to the entire scheme. The first requirement is to establish to a satisfactory degree of certainty a basis that is correct; then each successive step will become simply a matter of careful analysis. Before attempting a detailed analysis of the various elements comprising the development of burden, it is of great importance to have a thorough understanding of just what is included by the term. Burden may be defined as that expense consisting of all charges incurred in the manufacturing activities of a business not directly applied to the product as productive labor or raw material is applied. Superintendence, rent, maintenance, and etcetra, together with such perpetuation charges as interest on investment, depreciation, insurance and other unclassified expense items of the general plant will give an idea of what the composition of burden is.

Burden, however, cannot be charged directly to specific departments, for it requires distribution according to fixed principles or rules: To illustrate, superintendence, against which the salary of the general superintendent is chargeable, could not be assessed directly against any one department; it is, therefore, simply charged in blanket form and pro-rated against the various departments on the basis of the number of employees in each, or the approximate amount of time superintendence is spent in each. A factory superintendent does not superintend floor space or machines, but he does superintend the personnel of each department or production center, therefore his salary and the salaries of his general staff are chargeable to the various production centers on the basis of the normal employees in each department or production center, or the amount of time devoted to the superintendence of each. On the other hand, rent expense is distributed on the basis of floor space occupied by each production center or department; power expense on the basis of kilowatt hours consumed; and fixed charges on the basis of face values of equipment in each production center or department, or the floor space occupied by the equipment of each.

(Continued on Page 223)

VULCANIZATION & ACCELERATORS

By Andre Dubosc

PART 1*

Theory of Vulcanization

In this Installment the History of Vulcanization is Discussed--The Theories of Payne, Hinzerlin, Unger, and Seligmann Described in Detail--Opinions of Other Chemists of the Period

EVER since rubber was discovered by La Condamine, its history may be considered as being composed of two great epochs. The first is that in which Goodyear and Hancock discovered the vulcanization of rubber, which allowed the stabilization of the properties of this elastic gum of so remarkable a character.

The other which is sixty years removed from the first is the one in which the accelerators were discovered, whose technical application to the vulcanization has permitted the reduction of the time of this operation, the lowering of the temperature at which it is conducted, while increasing the mechanical strength of the final vulcanized product.

In a period, where the statément "time is money" is perhaps truer than ever, where the slightest saving in fuel is of vital importance and value, the economic consequences of such a discovery have been of inestimable significance, for it has allowed the manufacturers of rubber merchandise to triple the production of their plants with the same equipment in the same period of time.

If it had not been possible to use accelerators in the vulcanization of rubber, it would not have been possible for the rubber makers of the United States and Europe to have met the demands for rubber merchandise, so varied in character, that were made upon them during the world war, and the enormous development attendant upon the growth of the automobile and aviation industries, would not have been possible.

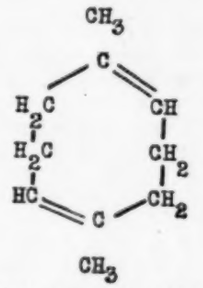
The Action of Sulphur in Vulcanization

Before proceeding to a study of these very strange substances, before analyzing the manner in which they effect their potent results on the vulcanization of rubber, it is first necessary, in order to have an exact conception of how they act in this process, to examine the materials on which they exert their action and to determine just how rubber behaves when it is subjected to the influence of the vulcanizing agent, par excellence, sulphur.

The investigations which were conducted by Harries have shown that rubber—at least in the elementary condition, for it is susceptible of polymerization—is constituted of a cylic hydrocarbon with two branch chains. In other it is dimethyl-cyclo-octadiene.

The Rubber Formula

This substance contains in its nucleus eight atoms of the element carbon and among the innumerable members of the carbon family—the organic compounds, it is the only one, with the exception of Wilstoetter's carbide, to which such a formula applies. This formula may be written in the following manner:



There are two ethylene bonds in the formula.

The substance, sulphur, by fixing itself to the double bond carbon atoms in the molecule and saturating the latter, vulcanizes the rubber.

When it is explained in this fashion, the reaction which effects the vulcanization of the rubber, appears to be extremely simple. Unfortunately it is much more complicated than it looks for the reason that rubber, due to its inherent nature, is not exactly represented under the form of a molecule of dimethyl-cyclo-octadiene of single identity. Rubber is rather to be considered as composed of a chain of molecules composed of many such polymerized methyl-cyclo-octadiene identities. In accordance with the state of the polymerization, rubber is capable of absorbing and fixing from two grams of sulphur in the case of merchandise which has been very slightly vulcanized, as for example rubber bands, up to a maximum of thirty-two grams in the case of rubber articles which are saturated with sulphur, as for example, ebonite.

The question is how to explain these variations.

Many Theories of Vulcanization

Hence there is here presented a very serious problem and in connection with it, there have been suggested innumerable hypothesis, for the simple reason that although the practical side of the vulcanization of rubber may be well understood, an exact and explicit explanation of the chemical mechanism of the operation is still to be found.

The early investigators who concerned themselves with rubber and its technology, Goodyear and Hancock, who were just practical men, devoid of all chemical knowledge and training, simply stated in so many words the results of experiments which they made and which by a happy chance produced remarkable consequences. On the other hand they did not spend a single moment in trying to determine and to render an exact account of what might have taken place in the reactions between sulphur and rubber which are known to be so varied in nature.

Once they had achieved practical results, they did not worry about anything else. The solution of the problem in the way

*When this series is later published in book form, the material used in the May 10 and May 25 issues will constitute the Introduction—*The Editor*

in which they developed it was, hence, of an empirical nature only and as a result thereof the vulcanization of rubber, which should have been an exact science, has remained an art for a long time. In other words, it has been something inexact, indefinite; something that did not yield results in a constant fashion, that did not give identical results, and in which chance played far too often the principal role.

What the Chemists Said at the Time

"The effects of vulcanization," said Seligmann, Lamy-Torrilhon and Falconet in their treatise on rubber, which was published about forty years ago, "the effects of vulcanization are brought about by a phenomenon which is badly defined and not well-understood. The chemical reactions which appear to take place during the vulcanization of rubber have been studied but slightly and even less effectively explained in a satisfactory manner."

All the chemists of that epoch were undecided on this question and the great majority of them considered the vulcanization of rubber to be the result of an "absorption" of sulphur, neglecting to say just what they understood by this word.

To be sure they said that rubber combined with two per cent of sulphur in the vulcanization process, but they did not agree on the nature of this absorption.

Certain of these chemists admitted that vulcanization was the result of a true chemical reaction, which started at a temperature of 120 degrees C and finished at a temperature of 160 degrees C. The transformation of the crude rubber into a soft, elastic vulcanized product, remaining so at all temperatures, was represented as the starting point of this reaction and the formation of hard rubber, ebonite, the final result of the reaction.

The Payen Theory

Payen was the first who attempted to evolve a theory of vulcanization.

As soon as the reaction between rubber and sulphur commences, he said, and during the entire period of time that it takes place, that is to say from a temperature of 135 degrees C to one of 145 degrees C, there takes place a combination between sulphur and a small amount of hydrogen which is generated from the organic substance present in the mixture and, due to this reaction, there results a constant formation of sulphuretted hydrogen, of which sulphur can absorb a volume equal to its own.

During the vulcanization of rubber in a bath, in accordance with the method devised by Hancock, at the moment when, after vulcanization has taken place, the temperature is reduced, the sulphur, while crystallizing, sets free a part of the sulphuretted hydrogen which was formed. This gas is evolved between the crystals of sulphur and converts the mass into a semi-liquid condition.

It is known that the contrary takes place; in other words that an evident contraction takes place during the cooling and the crystallization of the sulphur free from sulphuretted hydrogen.

Vulcanization Due to Juxtaposition

Vulcanization therefore seems to be due to a condition of juxtaposition, the rubber having absorbed the sulphur and sulphuretted hydrogen up to the point that it becomes saturated; then a combination takes place between the two substances in a certain proportion, with final elimination of the excess sulphur.

Payen states on the other hand that if a sample of the gum is subjected to examination under the microscope, the separate particles of sulphur in the mass may readily be detected and it can be seen that the distribution of these particles throughout the mass is irregular. The percentage of sulphur present in the mass of vulcanized rubber decreases gradually from the exterior to the interior.

Payen's theory has been largely discussed, and in spite of the reputation that its author had in chemical matters, the explanation of vulcanization of rubber by juxtaposition has not been accepted by many chemists. However, it may be contended that it represents a compromise between the adsorption theory and the chemical combination theory of which Ostwald and Weber may be said to be the respective champions.

One of the principal adversaries of the Payen theory has been Seligmann, who believed in the existence and the operation of a true chemical reaction in the process of vulcanigation. This the juxtaposition theory of vulcanization does not explain.

The Hinzerlin Theory

Hinzerlin likewise believes that a true chemical reaction takes place in the vulcanization of rubber. "It is still not exactly known," he writes, "if sulphur, when it combines with the rubber molecule, gives rise to a simple juxtaposition of a new additional substance, that is, if the sulphur combines additively with the rubber, or if it is substituted chemically for a hydrogen in the rubber formula. Does the union of sulphur and rubber actually constitute a true chemical combination? The answer to this question is found to be undoubtedly in the affirmative from a consideration of the fact that both the rubber and sulphur are soluble in carbon disulphide, before they are subjected to heat, and after vulcanization has taken place, their combination becomes completely insoluble."

The reasons given by Hinzerlin seem to establish in a rather conclusive fashion the truth of the chemical combination theory. But Seligmann has made the observation that certain metallic sulphides, as for example, the pentasulphide of antimony, which are excellent vulcanizing agents, are not soluble in carbon disulphide.

The Unger Theory

"We do not know," says Unger, "the nature of the organic sulphurated combination which forms during the vulcanization of rubber. It is possible that the white substance that forms on the surface of masses of rubber and which, when examined under the microscope, appears in the form of small, lustrous white crystals, may be that compound of rubber and sulphur, which consists of the combination of the rubber hydrocarbon with the mineral sulphur and distributed throughout the mass of the rubber confers upon it the properties of a vulcanized gum."

It is known today that this substance is always found when pure sulphur is in excess and under these conditions it is crystallized from the solid solution on the surface of the solid. Unger on the other hand offers here an idea which was later discussed in more detail by Ostromyslowsky, but he is entirely wrong in his conception of the substance which effloresces on the surface of the mass of vulcanized rubber.

The Seligmann Theory

In the study of the vulcanization of rubber, as Seligmann correctly declares, the chemist and investigator is primarily concerned with the action of the sulphur and its derivatives on the rubber gum, that above everything else. But not sufficient consideration has been given to the effect of the temperature both on the rubber gum as well as on the agents that carry out the vulcanization.

It is exceedingly important to bear in mind the following considerations:

1. That normal rubber is a porous substance to a certain degree.

2. That it will swell up or expand when subjected to high temperatures.

3. That it has the power to absorb by capillary action liquid or gaseous substances and that this property of rubber is more energetically exhibited, the greater it has been dilated or swelled up by heat.

4. That what is commonly called rubber is not a definite, fixed hydrocarbon, but rather a mixture of two polymerized hydrocarbons, in certain definite proportions, which are derived from a basic hydrocarbon, whose formula is C_5H_8. One of these polymerized hydrocarbons possesses in a high degree the property of adhesiveness and the other the property of nerve or strength, as the French say, "nervosite."

Under the influence of heat rubber commences to become viscous. At a temperature of approximately 145 degrees C it loses its elasticity. Moreover it is only after a prolonged period of cooling that the *exclusive elasticity* of the "nerve" hydrocarbon, regains in part some of its original intensity. Thus when the gum is heated to a temperature of 145 degrees C, it will become irrevocably enervated in part.

Taking into consideration all these points, Seligmann has

derived the following theory of vulcanization, which is exemplified in the application of the Goodyear process.

The "adhesive" hydrocarbon and the "nerve" hydrocarbon are mixed together very intimately with the vulcanizing agent, sulphur, by the ordinary operation of mixing, at the moment when the intervention of heat is solicited. Up to a temperature of 120 degrees C, no chemical reaction takes place, but simply juxtaposition. From that moment on sulphur begins to change its state, it starts to fuse. At the same time the pores of the rubber mass are sufficiently dilated to permit the gradual absorption of the liquefied sulphur. Chemical reaction starts: The liquid sulphur unites with the "adhesive" hydrocarbon and forms with it a new chemical substance or better an *alloy*.

An Alloy is Formed

This action continues at the same temperature and the mass becomes impregnated more and more with the liquid sulphur, that it penetrates farther into the rubber structure. If the operation is stopped at this point the vulcanization will be complete or rather the sulphuration of the "adhesive" hydrocarbon will be complete but the "nerve" hydrocarbon will not be touched.

If, on the contrary, the duration of the operation is prolonged, and the temperature is raised to 145 degrees C, the "nerve" hydrocarbon will lose its structure and blend with the part of the rubber that has previously been vulcanized. Another reaction takes place. Complete sulphuration will be obtained with the formation of the substance, ebonite.

Vulcanization a Matter of Stages

Hence the phenomenon, which is called vulcanization of rubber, would be just the first stage of a series of transformations to which the hydrocarbons, which constitute the rubber gum, are subjected, and which are determined by the temperature at which heating takes place in the presence of sulphur in excess. The endpoint of these transformations would, therefore, be hard rubber or ebonite.

From the practical point of view, the vulcanization of rubber is here represented as a sort of trick, which allows the manipulator of the process to stop it at any opportune moment, that is, the reaction, which commences at the beginning of vulcanization and at whose final termination there is obtained a different product—ebonite—from that which it was proposed to obtain—soft rubber.

Moreover the phenomenon can be continuous.

A soft rubber can become hard and brittle, if the reaction is not stopped or rather controlled by the elimination of excess sulphur and by rapid cooling. This is what is called over-vulcanization, a condition which is well known to practical rubber men.

On the other hand a gum which has been imperfectly vulcanized can be changed into perfectly vulcanized rubber, if it still contains free sulphur and if it is kept in a surrounding medium which is at the proper temperature.

Arguments in Support of Seligmann Theory

In support and substantiation of his theory, Seligmann mentions the following experiment and observation which were made by Payen, who shows, according to the former, the existence of two separate distinct hydrocarbons in the gum.

"Ether and carbon disulphide, when they are maintained for an extended period of time in contact with vulcanized rubber, dissolve from four to five per cent of the gum, which can then be isolated by evaporation of the solvent.

The rubber, which has been treated in this manner, can therefore be separated into two parts.

One of these parts is very ductile; it is soluble in benzine, and is recovered from the latter solution by evaporation of the solvent. The other is more tenacious, less elastic and insoluble in the benzine solvent. After vulcanization rubber is accordingly formed of two parts, which are endowed with different degrees of cohesion and unequal solubility.

According to Seligmann, the soluble part of the rubber corresponds to the "adhesive" hydrocarbon, in the form to which it is converted by sulphuration. The insoluble part is the "nerve" hydrocarbon, which does not enter into a combination with sulphur.

The proportions in which these two substances exist in the rubber are as follows:

Tough part, insoluble	65 per cent
Adhesive part, soluble	35 per cent

Vulcanization by Metallic Sulphides

In order to explain the vulcanization of rubber by metallic sulphides, Seligmann considers the action of these compounds as resulting in a true alloy of the rubber and the sulphide. As is indicated by the investigator Donath, the results in sulphide vulcanization are the same as those obtained in the vulcanization process conducted under ordinary conditions, but with this difference, namely, that a reaction of a chemical nature does not take place. Hence it is impossible to make ebonite at a temperature of 145 degrees C with these substances.

As far as vulcanization, which is carried out with the aid of the chloride, the bromide and the iodide of sulphur, is concerned, these substances easily penetrate into the pores of the gum in the cold. The transformability of the product in the presence of organic matter, which has a strong affinity for the halogens, results in the formation of sulphur in the nascent state. The solvent easily replaces the effect of heat in the vulcanization process and facilitates the reaction, which moreover is limited to the first part of the transformation.

It does not become complete unless heat is added, and only then can it finally go to a conclusion, resulting in the formation of hard rubber or ebonite, provided however that a sufficient amount of the vulcanizing agent is present in the rubber mixture.

This theory, propounded by Seligmann, although it was rather incomplete and full of errors, was a rather remarkable contribution for the period in which it was evolved, for at that time the attention of rubber men was almost entirely directed along practical lines, and little if any consideration was given the theoretical side of the problem. It was absolutely the first time that anyone tried to evolve a plausible explanation of the phenomenon, the vulcanization of rubber.

Parkes seems to have been the first one to see the chemical character of the conditions surrounding the vulcanization process; he understood these more clearly than any of his predecessors or contemporaries. Then later on the hypotheses which were expounded by Weber in the year 1903 carried the theory on to what may be called truely scientific ground.

Mr. Dubosc will take up the theories of Weber, Ostwald, Axelrod and others in the instalment to be published in the June 25th issue.—THE EDITOR

Rubber Manufacturing in Canton, China

According to statistics of the Chinese Maritime Customs, the imports of rubber into Canton have increased from forty-four tons in 1920 to three hundred and eight tons in 1922. The figures for 1923 are not yet available. There are about twenty factories in Canton producing rubber soles and it is understood that almost the entire imports of rubber is consumed by these concerns. There is no local manufacture of tires. The product of the local rubber sole factories is disposed of to Chinese shoemakers and goes largely into the production of canvas shoes which are popular with the Chinese in this district.

Although the manufacturing of rubber soles has been developing rapidly during the past three years, says U. S. Consul General Douglas Jenkins, it appears that the industry received a set-back during the latter half of 1923 because of Labor difficulties and unsettled conditions generally. This unfavorable situation resulted in the suspension of business on the part of a number of the rubber sole factories and it is possible that the import of rubber from abroad may show some decline during the current year.

All of the rubber sole factories in this district are owned and operated by Chinese. These factories are relatively small concerns and use but little machinery, most of the work being done by hand. Some of the machinery is driven by steam power, while electricity is used in one or two establishments.

Status of the Dutch Rubber Industry *

Of 29 Plants in 1914 Only 15 Now Operating — Dutch People Prefer Foreign Goods — Currency Exchange Plays Big Role

By P. J. Van Hees

THE condition of the Dutch rubber industry is extremely bad. Of the 29 factories that were in existence in 1914 only some 15 now remain and all of these, with a single exception, are said to be in a precarious condition. A further severe contraction in the local rubber industry seems to be necessary. A serious detriment to the industry is the natural preference of the Dutch public for foreign products. The latest available consumption and production statistics of the industry for the years 1921 and 1922, covering 15 factories, are as follows:

	1921		1922	
	Quantity in K. G.:	Value in florins:	Quantity in K. G.:	Value in florins:
Raw Materials:				
Crude rubber	646,940	1,034,125	774,313	867,979
Semi finished rubber	205,527	93,901	224,212	47,305
Metal materials	—	280,356	—	268,217
Yarn, textiles, etc.	—	973,668	—	901,315
Other materials (dyes, sulphur, chemcals, etc.)	—	614,277	—	558,291
Total	—	2,996,327	—	2,643,107
Total Production:		6,922,712		5,937,262
Total Sales:		7,312,013		6,342,118
Sold for home consumption		6,872,054		5,253,727
Sold for export		439,959		1,088,391
	Number		Number	
Total Personnel:	1,553		1,218	
Administrative and technical	309		246	
Laborers	1,244		972	

The value of raw materials consumed and of finished products turned out has decreased. Sales for both years surpassed production by about equal amounts. Production and sales decreased, although not in such measure as to correspond with the smaller number of hands employed, indicating greater efficiency in operation of plants. The sale of articles for exportation increased considerably.

Competition is very keen, both at home and abroad, and in the export trade, the depreciated value of foreign currency also plays a considerable role. With respect to cycle tires, the leading competitors are France (Michelin), England (Dunlop) and Belgium; for motor car tire equipment, the same countries and the United States. Until recently, Germany was the most important supplier for both cycle tires and tubes on account of the depreciated exchange. This is no longer true, but there are still some very large stocks of unsold German tires in Holland. It is noteworthy that German cycle tubes were imported at one time at a declared unit value of .45 florins ($.18). The importations of rubber articles in the Netherlands are shown in the following official statistics:

IMPORTS OF RUBBER GOODS INTO THE NETHERLANDS

	Automobile Casings		Automobile Tubes	
	Number	Florins	Number	Florins
1921	38,823	2,636,000	33,481	295,000
1922	49,273	2,611,000	39,492	242,000
1923	81,726	2,956,000	73,653	366,000
	Motor Cycle Casings		Motor Cycle Tubes	
1921	10,360	250,000	15,538	61,000
1922	12,847	200,000	12,548	50,000
1923	15,154	213,000	23,048	70,000
	Cycle Casings		Cycle Tubes	
1921	597,122	1,864,000	1,168,095	990,000
1922	915,902	2,017,000	1,598,731	935,000
1923	1,340,779	2,308,000	1,340,743	726,000
	Solid and Cushion Tires		Other Rubber Articles	
			metric tons	
1921	1,956	176,000	1,160	2,124,000
1922	3,254	204,000	1,762	2,744,000
1923	5,825	358,000	1,778	2,596,000

The importation of tires into the Netherlands shows a gradual increase for all kinds, except the cycle tubes of which the 1923 imports fell below those of 1922. This increase in imports is only one of the features of the growth of motor vehicle traffic in the Netherlands, which country has become an attractive field for all foreign motor vehicle manufacturers. The downward trend of tire prices is reflected in the import statistics.

The number of passenger cars in use is unofficially estimated at 19,600; about 14,000 trucks, 31,500 motor cycles and approximately 1,000,000 bicycles.

About 40 per cent of the automobile tires are imported from France, the United States taking second place. Motorcycle tires imported were mostly of British origin. During 1923, 36 per cent of the bicycle casings came from Belgium; during the previous years Germany led. Germany also supplied the major portion of the bicycle inner tube imports into the Netherlands. The solid and cushion tires are procured mostly from Germany and Great Britain in about equal quantities. Of other rubber articles, Germany furnishes abut 75 per cent of the Dutch imports; practically none of these goods are reexported. The United States does not play an important role in the Dutch imports of rubber articles, except automobile tires; in 1923 imports from the United States amounted to 17,396 casings and 15,601 inner tubes. Tires mounted on imported vehicles are not incorporated in the foregoing statistics.

Review of Crude Rubber Trade in Holland

Owing to the diminished requirements of the Dutch rubber factories, the imports of crude rubber have decreased considerably; direct shipments from Dutch Colonies to the United States greatly influence this business. The main source of plantation rubber imported into the Netherlands is the Dutch East Indies. It is shipped to Amsterdam where the main offices of the rubber estates are located. As a rule, Dutch rubber manufacturers do not buy directly in the Indies, but at the Amsterdam auctions which are held periodically and where sales are made by sealed tender and through the medium of brokers. During the nine auctions held in 1923 only 457,900 kilograms of rubber were offered against 2,228,005 kilograms in the eleven auctions held in 1922. A considerable part of the 1924 crop has already been sold f.o.b. Dutch East Indies by the producers. Germany and the United States have taken most of the exports of crude rubber from the Netherlands. Dutch imports and exports of crude rubber for the years 1921, 1922 and 1923 were as follows:

IMPORTS

	Wild Rubber		Plantation Rubber	
	metric tons	florins	metric tons	florins
1921	460	420,000	14,353	14,363,000
1922	338	280,000	8,565	7,787,000
1923	339	406,000	7,731	11,075,000
		EXPORTS		
1921	349	332,000	13,426	12,061,000
1922	423	337,000	12,347	11,489,000
1923	456	508,000	6,809	10,040,000

The following tables give official statistics of exports of rubber articles from the Netherlands:

	Auto Casings		Auto Tubes		Motorcycle Casings		Motorcycle Shoes	
	number	1000 florins	number	1000 florins	number	1000 florins	number	1000 florins
1921	6,810	387	4,216	36	473	10	69	—
1922	10,794	483	8,371	48	970	16	376	2
1923	7,503	246	4,552	19	399	6	333	1
	Cycle Casings		Cycle Tubes		Solid & Cushion Tires		Other Rubber Articles	
	number	1000 florins	number	1000 florins	number	1000 florins	number	1000 florins
1921	128,578	382	82,003	74	345	34	55	158
1922	273,283	541	96,257	68	1,939	220	108	173
1923	569,731	936	61,168	39	1,524	295	107	165

*This information was contained in a recent report furnished to the Department of Commerce.

It may be safely assumed that more than 75 per cent of the rubber goods exported are manufactured in the Netherlands. The most important item in number and value are the cycle casings and tubes which mainly go to Great Britain and Belgium; Great Britain is also the most important buyer of automobile casings and tubes. In general, exports of rubber goods except cycle casings show a decided drop in 1923, which reflects the downward trend in this industry, which still prevails, despite the efforts and good work of the "Government's Advisory Service for the Rubber Trade and Industry." This Institution forms part of the Dutch Department of Agriculture and was founded in 1910; its purpose is to supply data regarding trade in rubber and allied products and the manufacturing thereof, to conduct experiments and researches and to test materials and samples. All tires bought by the Department of War are regularly inspected by this service, while the Colonial Department submits samples of rubber goods destined for the colonies. During the last year the Service has made an exhaustive study of the properties and uses of latex. They are in constant touch with the experimental rubber testing stations in the Dutch East Indies, namely the Central Rubber Station at Buitenzorg (Java) and the General A.V.R.O.S. (General Association of Rubber Planters on the Easteoast of Sumatra) at Medan. Another important organization is the "International Association for Rubber Cultivation in the Dutch East Indies" at the Hague.

There is a special propaganda section at the Hague for promoting the use of rubber. This department collects data regarding the production and consumption of crude and vulcanized rubber; it cooperates in finding markets for new rubber articles, and supplies names of manufacturers of specific products. The department organizes campaigns to call the attention of the public to new articles and uses of rubber. It assists inventors of new devices in marketing their products. Interested parties of all nationalities can apply to it for aid and advice, and it can be used as an intermediary in all matters pertaining to rubber.

There is also an Association of Rubber Manufacturers at Haar'em. A complete list of the Dutch rubber manufacturers can be secured from the Rubber Division. Refer to File Ru-16997.

The most important and largest rubber factory is the N. V. Vereenigde Nederlandsche Rubberfabrieken" at Heveadorp near Arnhem, founded in 1916, with an authorized capital of 10,000,000 florins. They have branches at Amsterdam, Rotterdam, Groningen, Leewarden, Arnhem, Moostricht, 's-Hertogenbosch and Basle; 6 agencies in the Netherlands and 2 in Great Britain, in addition a spinning mill at Bocholt (Germany). They manufacture all kinds of tires (Hevea), rubber shoes, heels and soles, and rubber flooring. The present personnel numbers 450, although they have given employment to as many as 1,000 and their daily output has at times reached approximately 5,000 cycle casings, 500 automobile casings, and as many inner tubes of both kinds. The factories cover an acre of 220,000 square meters.

The next important one is the "N. V. Rubberfabriek "Vredestein" at Loosduinen near the Hague; founded in 1908, with an authorized capital of 2,000,000 guilders. They manufacture different kinds of tires ("Vredestein"), and technical rubber goods. They employ 200 men and their daily capacity is estimated at 4,500 cycle casings, 3,000 inner tubes, 125 automobile tires and 25 solid tires.

Balloons Brought Chaos to Auto Industry

(Continued from Page 216)

Having reached this point, the tire makers conceived the idea that if all sizes of tires could be put on one size wheel it would be a beautiful manufacturing proposition.

However, they were unable to agree among themselves then as to the ideal size of that base—and the confusion of tongues still obtains.

One tire manufacturer insisted on using 20-inch base, another 21-inch. Neither of these were suitable for—a Buick car, for example. Nor for a Rickenbacker. If we used the 20-inch wheel as a base we had to adopt either a 31 x 5.25 tire or a 32 x 6.20 as our standard balloon tire.

This latter gave us too much periphery weight while the former reduced our road clearance to the danger point.

Buick, being one of the biggest producers in the business, insisted on a 22-inch wheel with a 5.77″ tire. Rickenbacker followed Buick's lead in the belief that if any "standard" were established it would be through the volume requirements of some big manufacturer. Two or three other prominent makers have followed this lead but—the entire matter is still up in the air.

Tire manufacturers are still not in agreement as to what sizes to make; and automobile manufacturers are equally confused as to which size they dare adopt as standard equipment.

This confusion threatens to be endless. Whatever size we adopt now is likely to be "scrapped" in the near future with the result that we will have thousands of customers complaining that we have given them wheels that cannot be fitted with tires. Because of course, the tire manufacturers are going to continue to make balloon tires, nor is the tire dealer going to continue to carry in stock, sizes for which there is only a small and ever diminishing demand.

The cost to the user is going to be excessive and his inconvenience aggravated, more and more as time passes for the full life of his car, unless he buys an entirely new set of wheels and tires. This is out of the question of course, in the majority of cases.

There is just one thing to do now. It is utterly useless for the tire makers to quarrel among themselves as to what they will or will not do.

They are not an independent industry—they are only auxiliary to the automobile industry, because they do not make a major product but simply an accessory. Therefore the first thing, is to ascertain what manufacturers of the various sizes of automobiles must have. Then establish wheel and tire standards to meet that condition.

Certainly concerns like Buick or Studebaker or Ford are not going to scrap their whole equipment or change speed of motors, redesign axles and gear ratios, etc., in order to meet the requirements of tire manufacturers.

The mountain cannot come to Mahomet—therefore Mahomet might just as well start trekking toward that immovable eminence—and the sooner he starts the sooner will he arrive.

Burden Distribution

(Continued from Page 218)

Manufacturers in the rubberizing industry in general recognize the vital importance of a knowledge of the cost of their product, yet how few of them have a cost system on which they are willing to rely under all conditions. If they base their policy on the idea that the cost of rubberizing fabric can only legitimately include the expense necessarily incurred either directly or indirectly in producing it, they shall find that their cost will be much lower than expected, and will find that they can do many things which under the old method of figuring appeared suicidal.

The view of costs so largely held, namely, that the product of a factory, however small, must bear the total burden, however large, is responsible for much of the confusion about costs and hence leads to unsound business policies. And if every rubberizer will accept the view that a yard of rubberized fabric should bear only that portion of the burden to produce it, their cost will not only become lower, but relatively far more constant, for the most variable factor in the cost of any article under the usual system of accounting has been the "burden" which has varied almost inversely as the amount of the product. This item becomes substantially constant if the "burden" is figured on the normal capacity of the plant.

Rubberizers should review their burden distributing system and ask themselves whether it fully meets requirements.

ANNOUNCEMENT TO OUR READERS

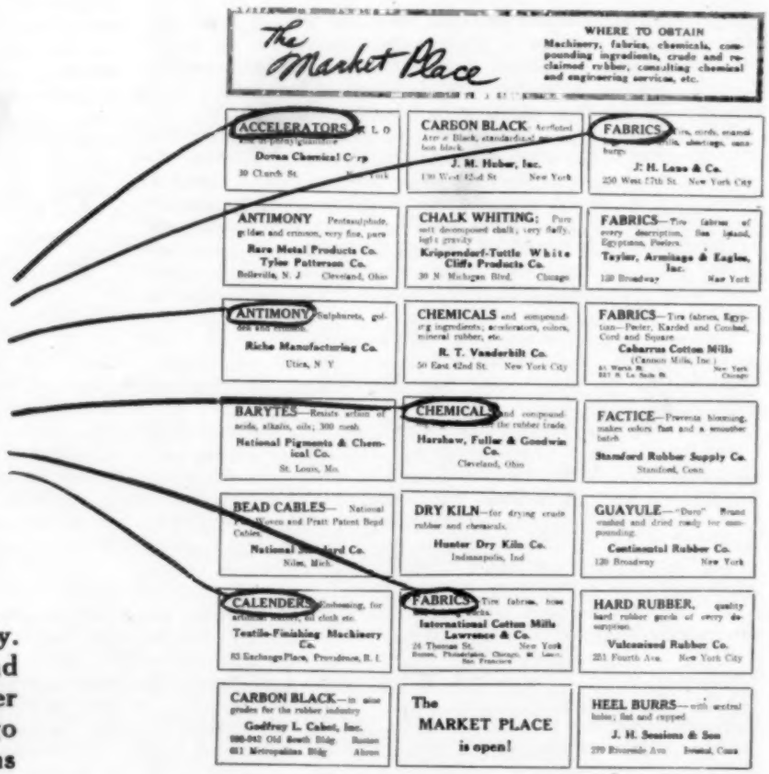
The Market Place

OPENS IN JULY 10 ISSUE OF THE RUBBER AGE

This new department, listing the names of machinery, fabric, chemical, crude rubber, etc., manufacturers and dealers is the result of a demand on the part of a number of the more progressive firms furnishing supplies or services to the rubber industry for a section allowing of more display than is permissible in our Buyers' Guide. Each listing in THE MARKET PLACE contains a brief description of the product and the complete name and address of the company. You can now easily locate the leaders in the rubber industry by consulting this section for, in fact, it is *the Main Street for Rubber Buyers!*

Convenience!

NOTE HOW EASY IT IS TO FIND ANY PARTICULAR HEAD IN THIS NEW SECTION



BUYERS — Use this section freely. You will find the most progressive and most representative firms in the rubber industry listed here. You can't go wrong when you deal with these firms —they are the cream of the trade!

RUBBER STATISTICS

Import **Production** **Export**

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

January, 1923 to April, 1924

"Production" and Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.
"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.
"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

(Compiled by The Rubber Association of America, Inc.)

	PNEUMATIC CASINGS				INNER TUBES				SOLID TIRES			
MONTH	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
January, 1923	62	4,695,916	3,127,270	2,994,297	62	5,838,310	3,951,885	3,748,651	11	262,462	83,383	60,611
February, 1923	60	5,224,387	3,217,987	2,588,639	60	6,771,958	4,039,202	3,001,697	11	270,191	75,457	63,394
March, 1923	58	5,670,601	3,865,726	3,322,637	57	7,740,945	4,875,414	3,828,315	11	265,843	79,788	77,144
April, 1923	56	6,088,272	3,539,326	2,976,160	55	8,394,184	4,259,558	3,535,635	11	260,631	71,468	72,609
May, 1923	57	6,906,594	3,659,986	2,757,764	57	9,292,223	4,317,537	3,414,115	10	268,323	77,288	67,147
June, 1923	55	7,040,600	2,956,943	2,502,185	54	8924,326	3,590,011	3,581,060	10	283,425	72,445	52,126
July, 1923	54	6,471,124	1,992,989	2,534,425	52	7,396,444	2,625,118	3,942,247	10	263,891	42,345	45,219
August, 1923	58	6,058,387	2,355,915	2,807,432	53	6,950,578	3,577,922	4,304,034	10	262,810	48,141	45,925
September, 1923	60	5,397,557	2,029,581	2,623,775	55	6,457,455	3,254,575	3,683,514	10	249,379	37,074	45,971
October, 1923	59	4,876,352	2,361,340	2,819,583	55	6,898,425	3,855,244	3,595,737	10	234,945	37,285	48,065
November, 1923	55	4,689,329	2,399,725	2,456,296	53	6,693,639	3,451,716	3,422,426	11	213,686	32,577	49,471
December, 1923	51	4,329,300	2,437,148	2,603,617	52	6,318,446	3,288,665	3,497,472	10	178,088	34,937	62,408
January, 1924	56	4,808,084	3,220,292	2,785,335	51	6,720,247	3,887,959	3,475,713	10	182,782	53,604	43,375
February, 1924	55	5,265,133	3,278,674	2,801,000*	50	7,339,307	4,067,631	3,329,504	10	188,519	60,646	49,370
March, 1924	57	5,763,084	3,427,692	2,902,274	53	8,157,704	4,218,950	3,420,723	10	203,608	68,662	57,847
April, 1924	60	6,164,226	3,307,478	3,013,441	54	8,627,343	4,053,242	3,586,279	10	212,419	69,564	58,486

*Revised.

Statistics Compiled from 1924 Questionnaire—First Quarter

COVERING THE THIRD THREE MONTHS OF 1923

Number of rubber manufacturers reporting data 231
Number of of crude rubber importers and dealers reporting data 47
Number of reclaimers (solely) reporting data 7

TOTAL DAILY AVERAGE NUMBER OF EMPLOYES
(On Basis of Third Week of March, 1924)
142,506

	Reported by Mfrs. who also reclaim (18)	Reported by Reclaimers solely (7)	Total
No. of Tons Reclaimed Rubber Produced from Raw and Cured Scrap	8,175	13,661	21,836
No. of Pounds of Scrap Rubber (including Raw and Cured Scrap) Consumed in production of Reclaimed Rubber	11,454	16,588	28,042

Number of Tons of Crude Rubber Consumed in the Manufacture of Rubber Products and Total Sales Value of Shipments of Manufactured Rubber Products

PRODUCT	Number of Tons of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries:		
Automobile and motor truck pneumatic casings	44,483	$104,781,000
Automobile and motor truck pneumatic tubes	11,438	18,026,000
Motorcycle tires (casings and tubes)	97	378,000
Bicycle tires (single tubes, casings and tubes)	230	854,000
All pneumatic casings and tubes, not elsewhere specified	3	44,000
Solid tires for motor vehicles	3,928	6,450,000
All other solid tires	64	149,000
Tire sundries and repair materials	680	2,970,000
TOTAL—Tires and Tire Sundries	60,920	$133,652,000
Other Rubber Products:		
Mechanical rubber goods	4,085	22,406,000
Boots and shoes	3,930	23,197,000
Insulated wire and insulating compounds	717	7,705,000
Druggist sundries, medical and surgical rubber goods	604	3,144,000
Waterproof cloth, clothing, and rubber sheeting	831	5,739,000
Hard rubber goods	943	3,209,000
Heels and soles	1,337	4,859,000
Miscellaneous, not included in any of above items	1,481	4,546,000
TOTAL—Other Rubber Products	13,928	74,805,000
GRAND TOTAL—ALL PRODUCTS	74,848	$208,457,000

Inventory of Crude Rubber in the United States and Afloat for U. S. Ports, March 31, 1924

ON HAND	Long Tons Plantation	Para	All Other
Manufacturers	45,795	4,207	724
Importers and Dealers	17,370	667	184
Total	63,165	4,874	68,947
GRAND TOTAL—ON HAND			68,947

AFLOAT	Long Tons Plantation	Para	All Other
Manufacturers	10,440	...	...
Importers and Dealers	29,920	361	182
Total	40,360	361	182
GRAND TOTAL—AFLOAT			40,903

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Report of Rims Inspected and Approved During May, 1924

Size	Number	Pct.
Clincher Rims:		
26 x 3	none	
28 x 3	none	
30 x 3	16,154	0.9
30 x 3½	880,610	47.0
31 x 4	33,432	1.8
Straightside, Passenger.		
27 x 3½	488	0.0
28 x 3½	110,897	5.9
29 x 3½	503	0.0
30 x 3½	141,394	7.6
32 x 3½	1,417	0.1
28 x 4	114,857	6.1
28 x 4 Airplane	45	0.0
29 x 4	124,364	6.5
30 x 4	42,710	2.3
31 x 4	3,414	0.2
32 x 4	94,418	5.0
33 x 4	4,508	0.4
29 x 4½	62,654	3.3
30 x 4½	48,132	2.5
31 x 4½	25,224	1.3
32 x 4½	113,516	6.1
34 x 4½	14,162	0.8
30 x 5	4,983	0.3
31 x 5	7,075	0.4
33 x 6	644	0.0
Truck Rims:		
30 x 5	3,277	0.2
34 x 5	16,800	0.9
32 x 6	3,544	0.2
36 x 6	3,386	0.2
38 x 7	1,169	0.1
40 x 8	1,023	0.1
	1,874,800	100.0

Watch for the opening

JULY 10

THE MARKET PLACE

MARKETS

Cottons and Fabrics

NEW YORK, June 16th, 1924.

Upon receipt of the official report on the cotton condition, showing the average of the present season to be 65.6 as compared with 71 last year, the market advanced from fifty to sixty points. Inasmuch as the majority of houses due to private advices, had looked for a low condition of a 66.8 per cent normal, the new low report caused a flurry in the market and a large amount of speculative buying ensued. However, this advance was short lived due to heavy liquidation on the July position and prices declined three quarters of a cent below early morning quotations.

Liverpool in sympathy with this market showed an advance of approximately two dollars a bale over the previous week's prices.

The prospects for the new crop this season would not seem to be conducive of heavy speculation on the part of anyone. The majority of cotton sections report heavy rains, trouble from plant lice and weevils, and it is understood that a considerable acreage has been abandoned owing to poor stands and the growth of heavy grass in the fields due to extremely wet weather.

Nevertheless, in the face of these existing conditions in the new crop, heavy liquidations on the July position continued during the past week with the premium of this position over October reduced to a minimum.

There is little doubt that, with the nearby positions well liquidated and a consequently steadier market, the new crop will come in for more attention and weather conditions during the coming months will become a chief factor in determining prices in the market.

During the week ended June 7th statistics, showing an increase to 76,000 bales as compared with 50,000 bales last year, would indicate that many of the plantations had a larger carry over during August, 1923, than was at first supposed, and as a consequence sellers offered freely in the market causing the July position to decline ten points. Further week-end figures show that spinners took 997,000 more bales this season than during the same period last year, while the visible supply of American cotton decreased only 87,000 bales as compared with 99,000 during 1923. The world's supply of all grades is now estimated at 2,907,000 as against 2,923,000 a year ago.

Reports of a decided advance in wheat and of better conditions in the stock market caused a rally of from two to twenty-four points in cotton during the first part of this week. Heavy rainfall in many sections caused an easing up of selling pressure on the July position with closing quotations on the nearby positions unchanged.

In many cases mills are finding it exceedingly difficult to make a profit due to the high cost of raw material as against the low price of finished goods at which they are forced to sell. Due to the lack of interest on the part of consumers the majority are now running on part time and rumors of further curtailment and possible shut downs are numerous.

The Quidnick-Windham Company, cotton manufacturers, with offices in this city, employing 450 hands in the Quidnick Mills and 350 at Willimantic, Conn., gave notice that the two plants would be closed indefinitely. Announcement was made that the shut down was due to the prevailing business slump.

To Confer on Statistics

As a result of complaints received from the cotton industry that the figures published by the Census Bureau were inaccurate, indicating that a double count must have been made of some stocks, reflecting a condition in the cotton industry which did not in fact exist, a committee on the compilation of cotton statistics was formed by Secretary Hoover and will hold their first meeting at the Census Bureau on the 20th and 21st of this month.

Quotations of this date follow:

	Open	High	Low	Close	Close June 2
July	28.60	28.80	28.57	28.80	29.78
October	25.60	26.03	25.45	25.98	26.73
December	24.85	25.28	24.84	25.26	25.97
January	24.61	25.00	24.58	24.98	26.00

TIRE FABRICS

An outstanding feature of this market for the past two weeks has been the increased volume of spot business placed by the mills for the account of tire manufacturers. Reports from fabric centers show that over fifty per cent of orders now placed are for immediate shipment, verifying the general opinion that the majority of tire factories have not at the present time sufficient fabric on hand to meet their requirements beyond the first of next month.

This existing condition, although it is perhaps beneficial to the tire trade, enabling them to take advantage of any fluctuations in the cotton market and while seemingly helpful to the fabric industry inasmuch as they are protected to a great extent from having any sizeable contracts left on their hands due to possible financial disturbances in the rubber industry, does not go toward making a healthy market. With the mills badly in need of business and in most instances forced to curtail, resulting competition has been keen and in many cases price concessions from two to three cents have been made.

With a minimum amount of inquiries being placed in the market, many mills are finding it desirable to dispose of old stocks on hand at prices considerably below the standard market level with the result that the quotation basis for the market is for the most part nominal.

The use of Egyptians as compared with Saks in Balloon tires continues to be more widespread with sales of the former grade noted in a fair quantity way at 69c and 70c. Under the heading of Carded Peeler Cord 54c is quoted as the nominal asking price for the 13/3/3 ply as against 57c for the 23/5/3 ply for nearby delivery.

Recent statistics report a production during April of 3,307,478 tires and shipments of 3,013,441 tires. Many are of the opinion that with a minimum surplus of tires on hand together with a thirty per cent increase in automobile production over last year, many factories will soon be forced to cover their future positions.

CORD FABRICS

Combed Sakellarides		Nominal		
Combed Peeler	lb.	Nominal		
Carded Peeler	lb.	.54	@	.57
Combed Egyptian uppers	lb.	.69	@	.70
Carded Egyptian uppers	lb.	.63	@	.65

COTTON PESTS IN AUSTRALIA

In a recent issue of the *Australian Cotton Grower* an article appears on cotton insects, an abstract of which is of interest:

"The cotton boll worm—heliothis obsoleta—has been established in Australia for many years. Maize, tobacco, tomatoes, peas, beans and alfalfa are among its other feed plants. The yellow monolepta beetle—monolepta rosea—is found in the coast districts from Manning River northward. Besides cotton this pest attacks roses and garden plants, corn silk and tassels and the leaves of all fruit trees.

"The 28 spotted ladybird—epliachna 28 punctata—is common in the warmer parts of Australia. It feeds on pumpkin, cucumber and similar plants and has recently been reported as attacking cotton. The Ruthergien bug—nysius vinitor Bregroth—is widely distributed over eastern Australia. Its food plants are grease weed, vegetables and field crops and fruit trees and it occasionally appears on cotton plants."

SQUARE WOVEN			
17¼-ounce Egyptian uppers, combed	lb.	Nominal	
17¼-ounce Egyptian uppers, carded	lb.	.62 @	.64
17¼-ounce Sakellarides, combed	lb.	Nominal	
17¼-ounce Peeler, carded	lb.	.54 @	.57

Ducks—A general quietness and a lack of consuming interest has featured the market for the past ten days. Although buyers are still confining their interest to spot lots, purchasing small quantities here and there in order to meet their necessary requirements, the mills on the other hand are not inclined to make any concessions in price, basing their price on 27c cotton and ignoring any slight reaction in the raw material. Orders for export in a fair quantity way were reported this week while sales of hose duck aggregating well over one hundred thousand pounds were noted at a figure well representative of today's market. The situation, as far as actual business consummated is concerned, is anything but bright but a better and more stabilized market is looked for during the coming summer months.

Burlaps—The market after a dull period preceding the holidays in Calcutta took on a brighter aspect with firmer prices and more interest shown on the part of consumers. Many bids, however, placed by buyers were from ten to fifteen points below the correct level and were therefore unacceptable to sellers. On the 6th the market was considerably stimulated and prices took on a new level owing to a report that two thousand bales of burlap had been damaged by fire on an incoming vessel. Manufacturers entered the market in order to cover any possible losses and brisk trading ensued. During the past week spots have advanced to 7.80c with few takers while goods far afloat showed a rise of five points.

SHEETINGS			
40-inch 2.50-yard	yd.	.16¼ @	.16½
40-inch 2.85-yard	yd.	.14¼ @	—
40-inch 3.15-yard	yd.	.14½ @	.14¾
40-inch 3.60-yard	yd.	.12¼ @	—
40-inch 3.75-yard	yd.	.10¾ @	—
40-inch 4.25-yard	yd.	.10 @	—
DUCKS			
Belting	lb.	.46 @	—
Hose	lb.	.46 @	—
Enameling	lb.	.44 @	.48
Shoe Ducks	lb.	.48 @	.52
Single filling		.21½ @	.23
Double filling	lb.	.23 @	.25
BURLAPS (Carload Lots)			
7½-ounce 40-inch		5.65 @	—
8 -ounce 40-inch		5.75 @	5.80
10 -ounce 40-inch		7.85 @	—
10½-ounce 40-inch		7.90 @	8.00
DRILLS			
37-inch 2.75-yard	yd.	.14 @	.14¼
37-inch 3.00-yard	yd.	.13½ @	—
37-inch 3.25-yard	yd.	.12¾ @	.13
37-inch 3.50-yard	yd.	.12 @	—
37-inch 3.95-yard	yd.	.10¼ @	.10½
OSNABURGS			
30-inch 7-ounce		.15 @	.15¼
40-inch 7-ounce		.16¼ @	.16½

GOOD WEATHER REPORTED IN COTTON BELT

The weekly weather report of the Department of Agriculture, issued in Washington recently, in part follows:

"Temperatures were generally above normal in the cotton belt, especially in the western portion, but it continued cool in the more northeastern districts. There was little or no rain in the western portion of the belt, but moderate showers were general in the east. The weather was mostly favorable and the cotton crop made satisfactory progress in nearly all sections with favorable weather for cultivation except in a few local areas.

"The well-rooted cotton in Texas made excellent growth, but the later-planted in the northwestern portion of the State was injured by the hot, dry weather; weevil were less active although there was considerable local damage by grasshoppers. The warm, dry weather favored rapid growth in Oklahoma, Arkansas and Louisiana, although it remained too wet in some northeast portions of Arkansas and there is much small cotton in that State, with stands irregular in Oklahoma and plants generally tall in Louisiana."

Trade Marks

MAY 27, 1924

(Subject to opposition within 30 days of above date)

APEX—No. 185,108. Columbia Tire & Rubber Co., Mansfield, Ohio. Inner tubes, pneumatic tires, cord tires and fabric tires.

DESIGN (consisting of the representation of a sign containing the words, "The Even Shops")—No. 185,694.M. J. Evens & Sons, Chicago, Ill. Rubber, leather and combination rubber and fabric shoes, etc.

DESIGN (representation of two lions with tongues curved upward resting one on each side of a shield containing the word "Selz.")—No. 191,410. Selz, Schwab & Co., Inc., Chicago, Ill. Leather boots, rubber boots, and shoes of leather, rubber, fabric and combinations of such materials.

RUBWOOD—No. 193,784. Rubwood, Inc., Lawrence, Mass. Vehicle wheels made of rubber-wood construction.

(Not subject to opposition)

THE REYNOLDS SHOE (in an oval)—No. 184,713. Reynolds, Drake & Gabell Co., North Easton, Mass.

BEVERLY—No. 184,719. C. Kenyon Co., Inc., Brooklyn, N. Y. Tires of fabric and rubber and rubber inner tubes.

Rubber Patents

MAY 27, 1924

1,495,237. Tire machine. John C. Allen, Meridian, Miss., assignor to the Goodyear Tire & Rubber Co., Akron, Ohio.

1,495,300. Tire armor. George Harford, Kansas City, Mo.

1,495,344. Tire-making machine. William B. Harsel, Akron, Ohio, and Edward Nall, deceased; by Edith Alice Nall, executrix, Akron, Ohio, assignors to the Goodyear Tire & Rubber Co., Akron, Ohio.

1,495,362. Method of making cushion tires. John M. Straub, Akron, Ohio, assignor to the B. F. Goodrich Co., New York, N. Y.

1,495,383. Puncture-sealing compound for pneumatic tires and the like. Charles Angus Cleghorn, East Molesey, Eng.

1,495,599. Automatic tire gauge. Henry A. Konkowski, Chicago, Ill., assignor of one-half to Martin V. Konkowski, Chicago, Ill.

1,495,665. Tire cover. Eugene Edwin Bigelow and Pearl Thompson, Pontiac, Mich.

1,495,721. Brake lining. William C. Swift, Cambridge, Mass.

1,495,768. Tire casing. Charles H. Braden, Los Angeles, Cal., assignor to National Aireless Tire Co., Los Angeles, Cal.

1,495,892. Rim. Frederick E. Donham and John Albrecht, Roseville, Cal.

New Incorporations

NEW YORK

Feinblatt-Weintraub, Inc. Capital $10,000. Rubberized fabrics. Incorporators, J. Weintraub, R. Weintraub and L. Berlin. Principal office, New York, N. Y.

Patboard Rubber Co., Inc. Capital $20,000 in $100 shares. To manufacture rubber goods. Incorporators, George S. Knapp, George W. Knapp and Charles F. Walden all of New York. Principal office, 10 Bridge St., New York, N. Y.

NORTH CAROLINA

Storms Tire Co. Capital $25,000. Incorporators, Burgin Pennel, L. E. Storms and W. R. Gilmore. Principal office, Ashville, N. C.

INDIANAPOLIS

Hi-Clearance Manufacturing Co. Capital $10,000. To manufacture metal, wood, rubber and leather products. Incorporators, William H. Ball, William A. Nottingham and Myron H. Gray.

OHIO

Ideal Tire & Rubber Co. Capital $20,000. Incorporators, J. A. Parfitt, Fred Bigler, D. T. Koelliker, Herman G. Nash, A. A. Parker and S. T. Walter. Principal office, Cincinnati, Ohio.

Kand W. Rubber Co. Capital $250,000. Incorporators, Ora Krichbaum and Guy V. Krichbaum. Principal office, Delaware, Ohio.

The O'Donnell Rubber Products Co. Capital $25,000 Incorporators, Louis J. Dolle, Walter C. Taylor, James B. O'Donnell, Alfred T. Geisler and John D. Ellis. Principal office, Cincinnati, Ohio.

NAME CHANGES

Syracuse, N. Y.—Reinforced Rubber Flooring Corp. to Syra-Bord Rubber Flooring Corp.

Chicago, Ill.—Warren Tire & Rubber Co. to Gillett Products Co.

Chemicals

SULPHURIC ACID—With little real interest shown on the part of buyers, the tone of the market has been weak. Dealers report sizeable stocks on hand and little business aside from contracts. Prices on 60-degree were $9 to $10 a ton, in tanks; and on 66 degree $14 to $15 in most directions.

ACCELERATORS—A fair amount of business has been done in this market of late with quotations on aniline oil made at 16c to 17c a pound works, and 17c to 18c a pound for nearby delivery. The market for litharge has been steady with sellers quoting $11.50 cwt. for spot. Quinoidine remains unchanged in price with thiocarbanilide coming in for little business at 27c to 29c a pound, spot.

MINERAL RUBBER—With a minimum of buying support on the part of consumers an easy and quiet tone has been the feature of this market for the past week. Prices remain nominally unchanged with sellers quoting $35 to $75 a ton for 300/315 quality.

COLORS—Only fair business has been noted of late on first hands with buyers showing little interest outside of their immediate requirements. For antimony, golden 19c to 24c a pound is quoted on spot while for crimson 39c to 50c a pound is asked by the majority of sellers.

ACETIC ACID—Little change is noted in this market. Consumers continue to place small orders for nearby shipment but refuse to consider futures. Price per barrel per 100 lbs. is quoted today at $3.12 for the 28 per cent.

Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET—NEW YORK, June 16, 1924—A general quietness has prevailed throughout this market for the past two weeks with prices for the most part remaining nominally unchanged from previous quotations. Many of the dealers report a fair amount of inquiry abroad in the market but orders for any sizeable quantities have been few and far between. As is the case in other markets consumers are inclined to buy only to meet their immediate requirements. However, in most directions an optimistic view of the situation is taken and with prices firm and few concessions being made by sellers it is felt that the tone of the market will be firmer during the coming months.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .90	@ .95
Aniline oil, drums	lb.	.17	@ .17½
Diphenylguanidine	lb.	1.10	@ 1.15
Excellerex,	lb.	.35	@ .40
Formaldehyde-Aniline	lb.	.50	@ —
Hexamethylene-tetramine	lb.	.82	@ .85
Paraphenylenediamine	lb.	1.55	@ —
Super-Sulphur No. 1	lb.	.50	@ .60
Super-Sulphur No. 2	lb.	.25	@ .35
Tetramethyl—Thiuramdisulphide	lb.	6.00	@ —
Thiocarbanilide, kegs	lb.	.27	@ .29
Vulcocene	lb.	.35	@ —

Inorganic

Lead, sublimed blue	lb.	.11	@ —
Lead, white	lb.	.10¼	@ —
Litharge, domestic	lb.	.10	@ —
Lime, Superfine	lb.	.02	@ .04
Magnesia, calcined, light,	lb.	.24	@ .26
extra light	lb.	.45	@ .60
heavy	lb.	.08	@ .08½

COLORS

Blacks

Arrow "Aerfloted"	lb.	.09½	@ .13
Bone Black	lb.	.05½	@ .07½
Carbon "	lb.	.09	@ .12
Drop "	lb.	.07½	@ .10
Ivory "	lb.	.15	@ .45
Lamp "	lb.	.12	@ .40
Micronex	lb.	.09	@ .14

Blues

Cobalt	lb.	.52	@ .56
Prussian	lb.	.72	@ .75
Ultramarine	lb.	.42	@ .56

Browns

Iron oxide	lb.	.02¼	@ .06¼
Sienna, Italian,	lb.	.06	@ .14½
Umber, Turkey,	lb.	.04	@ .04½
Vandyke, domestic	lb.	.03½	@ .04

Greens

Chrome, light	lb.	.28	@ .31
medium	lb.	.30	@ .35
dark	lb.	.32	@ .42
Commercial	lb.	.12	@ —

Reds

Antimony crimson, 15/17 F.S.	lb.	.42	@ .50
sulphur free	lb.	.45	@ .60
golden, 15/17 F.S.	lb.	.20	@ .22
calcium and sulphur free	lb.	.40	@ —
red sulph.15-17 F.S.	lb.	.16	@ .20
Indian, English	lb.	.11	@ .12
Para toner	lb.	.95	@ 1.00
commercial	lb.	.15	@ .18
Red Oxide, reduced	lb.	.08	@ .12
pure	lb.	.12	@ .14
Toluidine toner	lb.	2.00	@ 2.10
Venetian red	lb.	.02	@ .05½
Vermillion, quicksilver, English	lb.	1.35	@ 1.45
domestic	lb.	.15	@ .25

Whites

Albalith	lb.	.07	@ .07¼
Aluminum bronze	lb.	.55	@ .60
Lithopone Azolith	lb.	.06¼	@ .06¾
Zinc Oxide—American Process XX red	lb.	.07¾	@ .08½
Kadox, black label, bags, cars		.11¾	@ .12
blue " " "		.10¾	@ .11
red " " "		.09¾	@ .10
American Azo: ZZZ (lead free)	lb.	.07¾	@ .08½
ZZ (under 5 per cent leaded)	lb.	.07	@ .07½
Z (8-10 per cent leaded)	lb.	.06¾	@ .07¼
Zinc Oxide—French Process White seal	lb.	.12	@ —
Green seal	lb.	.10¾	@ —
Red seal	lb.	.09¾	@ —

Yellows

Chrome, light		.18	@ .18½
dark and medium	lb.	.18	@ .18½
Cadmium Sulphide	lb.	1.75	@ 2.50
Ocher, French	lb.	.01¾	@ .03
domestic	lb.	.02	@ .02½

COMPOUNDING INGREDIENTS

Aluminum Flake	ton	25.00	@40.00
hydrate light	lb.	.17	@ .18
Ammonia carbonate,	lb.	.13	@ .14½
Asbestine	ton	13.00	@15.00
Barium carbonate,	ton	68.00	@70.00
Barium Dust	lb.	.05	@ .06
Barytes southern off-color,	ton	15.00	@18.00
Western prime white	ton	22.00	@23.00
Imported	ton	28.00	@33.00
Basofor	lb.	.04½	@ —
Blanc fixe, dry f.o.b. works	lb.	.04	@ .04½
Carrara filler	lb.	.01½	@ .02
Chalk, precipitated, extra light	lb.	.04¼	@ .04½
heavy	lb.	.03¾	@ .04
Clay, China, domestic,	ton	12.00	@15.00
Dixie	ton	22.00	@32.00
Blue Ridge	ton	12.00	@25.00
Fossil flour	lb.	.03	@ .05
Glues, extra white	lb.	.22	@ .30
medium white	lb.	.20	@ .26
cabinet	lb.	.18	@ .28
cabinet low grade	lb.	.15	@ .18
common bone	lb.	.11	@ .14
Graphite flake, bbls.	lb.	.06½	@ .12
amorphous	lb.	.04	@ .10
Infusorial earth, powdered	ton	60.00	@ —
bolted	ton	70.00	@ —
Liquid latex	gal.	1.25	@ 1.35
Magnesia, carbonate	lb.	.08¼	@ .08¾
Mica, powdered	lb.	.07	@ .15
Rotten Stone (powdered)	lb.	.02	@ .05
Soapstone, powdered	ton	15.00	@22.00
Starch, powdered	cwt.	3.27	@ 3.54
Talc, domestic	ton	15.00	@22.00
French	ton	30.00	@35.00
French, high grade	ton	35.00	@45.00
Italian	ton	40.00	@50.00
Terra Alba	cwt.	1.85	@ 1.90
Tripoli, white	lb.	.02	@ .02¼
Whiting, commercial	cwt.	.85	@ 1.15
gilder's bolted	cwt.	1.10	@ 1.20
English cliffstone	cwt.	1.50	@ —
Paris whiteAmerican	cwt.	1.25	@ 1.50
Quaker	ton	13.00	@15.00
Sussex	ton	8.00	@16.00
Wood pulp XXX	ton	35.00	@ —
" " X	ton	25.00	@ —

MINERAL RUBBER

Genasco (factory)	ton	50.00	@52.00
Granulated M.R.	ton	50.00	@54.00
Hard hydrocarbon	ton	30.00	@40.00
Soft hydrocarbon	ton	30.00	@40.00
320/340 M. P. hydrocarbon (c. l. factory)	ton	45.00	@50.00
300/310 M. P. hydrocarbon (c.l. factory)	ton	40.00	@45.00
Synpro, granulated, M. R. (factory)	ton	55.00	@70.00

SOFTENERS

Acids

Acetic, 28%	cwt.	3.12	@ 3.37
Cresylic, 97%	gal.	.63	@ .70
95%		.61	@ .68
Muriatic, 20%	cwt.	.90	@ 1.00
Nitric, 36 degrees	cwt.	4.25	@ 4.50
Sulphuric, 60 degrees	ton	9.00	@10.00
66 degrees	ton	14.00	@15.00
Tartaric, crystals	lb.	.30	@ —

Alkalies

Caustic soda, 76%	cwt.	3.76	@ 3.91
Soda ash, 58%	cwt.	2.04	@ 2.19

Oils

Castor, No. 3, bbls.	lb.	.15	@ .15½
Chinawood, bbls.	lb.	.13	@ .13¼
Corn, crude, bbls.	lb.	.10¼	@ .10¾
refined	lb.	.11¾	@ .12
Cottonseed, crude		.08½	@ —
Glycerine,	lb.	.16½	@ .17
Linseed, domestic	gal.	.88	@ —
Palm, Niger	lb.	.06½	@ .06⅝
Lagos	lb.	.07	@ .07¼
Peanut,domestic,crude	lb.	.12½	@ —
Petroleum, amber	lb.	.04½	@ —
dark, amber	lb.	.04¼	@ .04½
Pine, steam distilled	lb.	.60	@ .65
Rapeseed, refined	gal.	.79	@ .82
blown	gal.	.96	@ .98
Rosin, first rectified	gal.	.40	@ .42
second rectified	gal.	.45	@ .47
Soya Bean		.11⅞	@ .12½
Tar, commercial	gal.	.30	@ .32

Resins and Pitches

Cumar resin, hard	lb.	.09	@ .10
soft	lb.	.09	@ .10
Parra M.R.	lb.	.06	@ .07
Tar Retort	bbl.	10.50	@11.00
kiln burned	bbl.	10.50	@11.00
Pitch, Burgundy	lb.	.65	@ .66
coal tar	gal.	.06	@ .08
pine	bbl.	5.50	@ 5.75
Resin, grade K	bbl.	6.10	@ —
Shellac, fine orange	lb.	.59	@ .61

Solvents

Acetone, drums	lb.	.15	@ —
Alcohol, denatured, No. 1 bbls.	gal.	.52½	@ .56½
Benzol, 90%	gal.	.23	@ —
pure		.24	@ .25
Carbon bisulphide	lb.	.06¾	@ —
tetrachloride	lb.	.07½	@ .08
Dimethylaniline	lb.	.36	@ .38
Motor gasoline, steel bbls.	gal.	.20	@ —
Naptha, V. M. & P.	gal.	.19	@ —
Toluene	gal.	.31	@ —
Turpentine, spirits	gal.	.84	@ .85
wood	gal.	.75	@ .76

Waxes

Bayberry	lb.	.21	@ .22
Beeswax	lb.	.43	@ .45
Carnauba, No. 1	lb.	.40	@ .41
Ceresin, white	lb.	.10	@ .11
Montan, crude	lb	.06	@ .06½
Ozokerite, black	lb.	.26	@ .27
green	lb.	.28	@ .29
Paraffine	lb.	.04½	@ .04⅝
Sweet wax	lb.	.12	@ —

SUBSTITUTES

Black	lb.	.08	@ .14
White	lb.	.10	@ .16
Brown	lb.	.10	@ .15
Brown factice	lb.	.10	@ .15
White factice	lb.	.09½	@ .16

VULCANIZING INGREDIENTS

Black hyposulphite	lb.	.25	@ .26
Sulphur Chloride (drums)	lb.	.05	@ .06
Sulphur flour Commercial bags,	cwt.	1.35	@ 1.70
" bbls.	cwt.	1.70	@ —
Superfine, bags,	cwt.	2.00	@ 2.40
" bbls.	cwt.	2.40	@ —
100% pure, refined, bags	cwt.	2.25	@ 2.55
bbls.	cwt.	2.50	@ 2.80

Crude Rubber

NEW YORK, June 16th, 1924.

The Whitsuntide holidays in London had the usual quieting effect upon the crude rubber market but the general inactivity which has featured this market during the past two weeks is attributed largely to the lack of business consummated for the account of manufacturers. Their continued hand-to-mouth policy and their failure to enter the market for future contracts has tended to create a shortage of spot rubber, thereby forcing this position to be held at a premium.

However, although a curtailment policy by many of the tire factories is anticipated, this policy being founded on a probable reduction in wages and a cut in tire prices, the opinion is expressed that the manufacturers will soon be in the market to cover their July/September and October/December positions in order to meet the original equipment requirements of the automobile industry.

In view of this fact a more healthy condition is looked for in the near future but at the present time the majority of dealers are still reluctant to take the long side of the market, and C.I.F. business placed abroad is practically nil.

Many rumors relative to the new restriction plans are still abroad but the majority of these are discounted.

On the 4th prices on the nearby positions advanced ½c to 19¾c on ribs with latex held at a one cent premium. This temporary recovery was due more to artificial causes than to any real consuming interest. Speculation and the lack of available spot rubber tended to create a flurry. On the 5th prices eased off ¼c to 19½c spot, with sellers willing to make concessions but with no takers.

On the 6th with London closed for three days the market remained nominally unchanged but on the 11th it again had a slight relapse of ¼c on all positions, this decline due chiefly to easier foreign cables.

The week ended with prices slightly lower, spot ribs possible to be bought in most directions at 18⅞c. Local dealers continued to place their bids freely but in most instances their ideas were unacceptable to sellers. Consumers in the Akron district continued to watch the market closely but displayed little interest in actual buying. Advices from London and Singapore report these markets as dull and quiet with little business doing. Foreign shippers are inclined to offer little rubber for shipment, no doubt feeling that it is useless to place offerings in the market until prices reach a more suitable parody with local ideas.

Reports from the National Automobile Chamber of Commerce of a 19 per cent decline in production as compared with April and a 23 per cent decline as compared with May, 1923, had already been discounted by the trade, and as a consequence had no visible effect on the market.

Total imports of crude rubber during May, amounting to 23,914 tons show a difference of 12,270 tons on the short side as compared with May, 1923, while total importations during five months ending May 31st, amounting to 137,476 tons show a falling off of 19,629 tons as compared with the same period last year. Quotations of this date follow:

Plantations—			
Ribbed Smoked Sheets:			
Spot	.18½	@	—
June	.18⅝	@	—
July-September	.18⅞	@	—
Oct.-Dec.	.19⅜	@	—
First Latex, crepe, spot	.19¾	@	—
Amber Crepe No. 1, spot	.18⅝	@	—
" " No. 2,	.18⅜	@	—
" " No. 3,	.18⅛	@	—
" " No. 4,	.17¾	@	—
Brown Crepe, Rolled	.17¼	@	—
" " Clean, thin	.18⅜	@	—
" " Specky	.17¾	@	—
Scrap, Colombo No. 1	.14¼	@	—
Pontianac—			
Prime Pressed	.12	@	—
Palembang	.07½	@	—
Bangermassin	.07	@	—
Sarawak	.06¾	@	—
Paras—			
Up-river Fine	.21	@	—
" Medium	.18	@	—
" Coarse	.13½	@	—
Islands, fine	.18	@	—
" medium	.17¼	@	—
" coarse	.11	@	—
Cameta	.12	@	—
Madeira Fine	.22	@	—
Acre Bolivian, fine	.21½	@	—
Cut Beni Bolivian, fine	.21	@	—
Tapajos, fine	.18	@	—
Xingu Ball	.12	@	—
Caucho Ball—			
Upper, shipment	.13	@	—
Centrals—			
Central, scrap, prime	.12¾	@	.13
Corinto, scrap	.12¾	@	.13
Esmeralda, sausage	.12¾	@	.13
Guayule, w and d	.22½	@	—
Africans—			
Benguela, No. 1	.12	@	—
" No. 2	.11	@	—
Congo, upper, black	.18	@	—
" " red	.17½	@	—
Kassai, Prime Red	.16¾	@	—
Balata—			
Black, Columbia	.47	@	.48
" Cuidad	.60	@	—
Surinam, sheet	.70	@	.71
Gutta Percha—			
Siak	.16	@	—
Red Macassar	2.80	@	3.00
Chicle—			
Mexican, Yucatan	.64	@	—

LONDON MARKET

Standard Ribbed Smoked Sheets—	
Spot	10¼d
July	10⅜
July-Sept.	10⅝
Oct.-Dec.	10¾

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—	
Spot	9⅝d
June	9¾
July-Sept.	10
Oct.-Dec.	10¼

CRUDE MARKET STEADY

June 18th, 1924.

As we go to press the tone of the crude rubber market is steadier with fair buying support on the part of both consumers and dealers noted. In the face of further buying sellers have advanced their prices one quarter cent above the previous day's closing quotations with sales for Ribbed Smoked Sheets spot reported at 18 3-8c and also at 18 1-2c. In many quarters the opinion is expressed that the steadiness of the market can be attributed largely to the absence of shipment rubber in the market. Late cables from London and Singapore report those centers as dull and unchanged with 10 3-8d offered for nearby with no takers.

Reclaimed Rubber

NEW YORK, June 16th, 1924.

Little change is noted in the market during the past two weeks. Reclaimers report little interest on the part of consumers in most directions although on the other hand manufacturers of insulated wire and rubber heels are reported to have entered the market for large sized quantities owing to the fact that reclaimed rubber has been forced down, due to curtailment, to a figure so far below the cost of crude that as a consequence many manufacturers find it advantageous to purchase the cheaper material. Prices are as follows:

Floating Tube	.14	@	.14¼
Friction, uncured	.18½	@	.19
Boots and Shoes (unwashed)	.09	@	.09¼
Boots and Shoes (washed)	.12½	@	.13
Mechanical	.09	@	.09½
Hose	.09½	@	.10
Tires, truck	.07⅞	@	.08
Tires, auto, black	.10	@	.10½
Black (washed)	.10	@	.10½
White	.13¼	@	.13¾
Dark Gray	.09¼	@	—
Light Gray	.10¾	@	—

Scrap Rubber

NEW YORK, June 16th, 1924.

Prices for Scrap remain nominally unchanged from quotations of the preceding month. Lack of buying interest on the part of consumers combined with the fact that available stocks now in the hands of dealers are plentiful tends to place the market on a none too firm basis. There has been a nominal amount of trading from time to time but the tonnage has been small in most instances. It is the opinion of several dealers that with more activity looked for in the crude rubber market during the coming months owing to the fact that many manufacturers will be forced to enter the market to cover their future positions, scrap rubber will react in sympathy and better prices will ensue during July/September and October/December. Prices are nominally as follows, F.O.B. New York:

Auto tire peelings	.00½	@	.00⅝
Standard White auto	ton 13.00	@	14.00
Mixed auto	ton 9.00	@	10.00
Bicycle tires	ton 6.00	@	7.00
Clean solid truck tires	.00½	@	.00⅝
Boots and shoes	.01⅝	@	.01¾
Arctics, untrimmed	.00⅝	@	.00¾
Arctics, trimmed	.00⅞	@	.01
Inner tubes, No. 1	.03¾	@	.03½
Inner tubes, compounded	.01¾	@	.02
Inner tubes, red	.01¾	@	.01⅞
Battery jars, clean hard rubber	.00⅞	@	.01
Air Brake Hose	ton 10.00	@	11.00
Rubber Hose	ton 7.00	@	8.00

English Dunlop Profits

The Dunlop Rubber Co., Ltd., recently reported profits from all sources of £1,915,608 for the eighteen months ended last December. Net profits, after payment of interest on debentures, etc. of £463,815, were £1,451,792. This profit does not take into account the deficit of the American Dunlop company for 1923. Indebtedness to banks of £2,019,977 shown on June 30, 1922 has been paid.

THE RUBBER AGE BUYERS GUIDE

ACCELERATORS
Dovan Chemical Corp., New York.
Grasselli Chemical Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, O.
National Aniline & Chemical Co., Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Rubber Service Laboratories Co., The, Akron, O.
Vanderbilt, R. T. Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago.

ACCUMULATORS
Adamson Machine Co., Akron, O.
Akron Rubber Mold & Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.

ACIDS
Harshaw, Fuller & Goodwin Co., The, Cleveland, O.
New Jersey Zinc Co., N. Y. City.
Wishnick-Tumpeer Chemical Co., Chicago.

ACID TANKS
Birmingham Iron Foundry, Derby, Conn.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.

AIR & STEAM METAL BAGS
Allsteel Ridewell Tire & Rubber Co., Dayton, Ohio.

AIR BRAKE HOSE
United States Rubber Co., New York.

AIR GOODS
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., N. Y. City.
United States Rubber Co., New York.

AIR MATTRESSES
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., N. Y. City.
United States Rubber Co., New York.

AIRPLANE AND BALLOON CLOTHS
Hodgman Rubber Co., N. Y. City.
United States Rubber Co., New York.

ALBA WHITING
Harshaw, Fuller & Goodwin Co., The, Cleveland, O.
Industrial Chemical Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago.

ALCOHOL
Harshaw, Fuller & Goodwin Co., The, Cleveland, O.
Wishnick-Tumpeer Chemical Co., Chicago.

ALUMINUM FILLER
Wishnick-Tumpeer Chemical Co., Chicago

ALUMINUM FLAKE
Aluminum Flake Co., Akron, Ohio.
Butcher, L. H., Co., New York.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., The, Cleveland, O.
Rubber Service Laboratories Co., The, Akron, O.

AMMONIA AQUA
Laidlow, Kelly & Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago.

ANGLE THERMOMETERS
Taylor Instrument Companies, Rochester, N. Y.

ANILINE OIL
Butcher, L. H., Co., New York.
Fulper, Edward B., Trenton, N. J.
Klipstein, A., & Co., New York.
National Aniline & Chemical Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago.

ANILINE OIL PLANTS
Devine, J. P., Co., Buffalo, N. Y.

ANTIMONY, SULPHURETS
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., New York.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., The, Cleveland, O.
States Metals Co., Inc., New York.
Rare Metal Products Co., Belleville, N. J.
Richo Manufacturing Co., Utica, N. Y.
Wishnick-Tumpeer Chemical Co., Chicago.

APRONS—RUBBER
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., N. Y. City.
I. B. Kleinert Rubber Co., N. Y. City.
Miller Rubber Co., Akron, Ohio.

ARTIFICIAL RUBBER
Carter Bell Mfg. Co., New York.
Everease Co., Wilton, Conn.
Stamford Rubber Supply Co., Stamford, Conn.

ASBESTINE
Butcher, L. H., Co., New York.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., The, Cleveland, O.
Wishnick-Tumpeer Chemical Co., Chicago.

ATOMIZERS
The Rubber Products Co., Barberton, Ohio.

AUTOCLAVES
Devine, J. P., Co., Buffalo, N. Y.

AUTOMOBILE COATS
Hodgman Rubber Co., N. Y. City.
United States Rubber Co., New York.

AUTO TOP FABRICS
Hodgman Rubber Co., N. Y. City.
Taylor, Armitage & Eagles, Inc., New York.
Turner, Co., J. Spencer, New York.
United States Rubber Co., New York.

BALATA
Wood, Charles E., New York.

BALATA FILM (Colorless)
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